

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

RECEIVED
★ DEC 21 1927 ★

U. S. Department of Agriculture

THE NEWS LETTER

OF THE

BUREAU OF PUBLIC ROADS

VOL. 3, NO. 1

NOVEMBER, 1927

A. C. ROSE, EDITOR

CONTENTS

CHIEF OF BUREAU TO BE KNIGHTED BY KING OF NORWAY - - - - -	1
U. S. SUPREME COURT RULES ON GRADE-CROSSING ACCIDENT - - - - -	2
REBUILT FRESNO EFFECTIVE FOR LOOSE-ROCK HAUL - - - - -	3
STATUS OF U. S. HIGHWAY MARKERS AND SIGNS - - - - -	5
YADKIN RIVER BRIDGE TEST PROGRESSING - - - - -	7
MOTOR VEHICLE REGISTRATIONS AND RECEIPTS - FIRST HALF OF 1927 - - - - -	10
GASOLINE TAXES - FIRST HALF OF 1927 - - - - -	11
NEW TRAFFIC-FLOW RECORDER IN USE ON CLEVELAND TRAFFIC SURVEY - - - - -	12
3,118 GRADE CROSSINGS ELIMINATED SINCE 1921 - - - - -	19
BURLAP CONCRETE-PAVEMENT COVERING SPREAD BY MECHANICALLY-OPERATED ROLL - - - - -	22
ORD FINISHER USED FOR SHAPING BITUMINOUS SURFACING - - - - -	24
JOHN G. ROSE - - - - -	28

CHIEF OF BUREAU TO BE KNIGHTED BY KING OF NORWAY

IN RECOGNITION OF HIS SERVICES TO THE NORWEGIAN BUREAU OF PUBLIC ROADS, MR. MACDONALD HAS BEEN OFFERED APPOINTMENT BY THE KING OF NORWAY AS A KNIGHT OF THE FIRST CLASS OF HIS ORDER OF ST. OLAV.

NOTIFICATION OF THE CONTEMPLATED HONOR WAS RECEIVED BY MR. MACDONALD ON NOVEMBER 10, THROUGH THE CHARGE D' AFFAIRES, AD INTERIM, OF THE ROYAL NORWEGIAN LEGATION, WHOSE LETTER FOLLOWS:

"MY DEAR MR. MACDONALD:

"I HAVE BEEN INSTRUCTED BY MY GOVERNMENT TO INFORM YOU THAT IT IS THE INTENTION OF HIS MAJESTY THE KING OF NORWAY TO APPOINT YOU A KNIGHT OF THE FIRST CLASS OF HIS ORDER OF ST. OLAV IN RECOGNITION OF SERVICES YOU HAVE RENDERED THE NORWEGIAN BUREAU OF PUBLIC ROADS, MORE ESPECIALLY SERVICES YOU HAVE BEEN GOOD ENOUGH TO RENDER MR. BAALSRUD, THE DIRECTOR OF PUBLIC ROADS OF NORWAY. I HAVE THE HONOR TO INQUIRE WHETHER YOU ARE DESIROUS OF ACCEPTING THIS CONTEMPLATED HONOR.

"I DO NOT OMIT TO INFORM YOU THAT I AM FULLY AWARE THAT IN YOUR CASE CONGRESS WOULD PROBABLY HAVE TO GIVE ITS CONSENT BEFORE YOU ARE ABLE TO ACCEPT AND WEAR A FOREIGN DECORATION. I WILL, IN CASE YOU ARE DESIROUS OF ACCEPTING THIS DISTINCTION, INQUIRE OF MY GOVERNMENT WHETHER IT HAS ANY OBJECTION TO DEPOSITING THE INSIGNIA OF THE ORDER WITH THE STATE DEPARTMENT UNTIL SUCH CONSENT CAN BE OBTAINED.

"I AM, MY DEAR MR. MACDONALD,

VERY SINCERELY YOURS,

(SIGNED) A. LUNDH.
CHARGE D' AFFAIRES A.I."

IT IS UNDERSTOOD THAT THE STATE DEPARTMENT WILL MAKE THE NECESSARY ARRANGEMENTS FOR ACCEPTANCE OF THE DISTINCTION, AND THAT THE ORDER ITSELF WILL BE HELD IN THE ARCHIVES OF THAT DEPARTMENT WHILE MR. MACDONALD REMAINS IN THE FEDERAL SERVICE.

U. S. SUPREME COURT RULES ON GRADE-CROSSING ACCIDENT

(NOT FOR RELEASE)

THE BALTIMORE AND OHIO RAILROAD
COMPANY, PETITIONER ,
VS.
DORA GOODMAN, ADMINISTRATRIX OF
NATHAN GOODMAN
No. 58.- OCTOBER TERM, 1927.

THE UNITED STATES SUPREME COURT,
IN AN OPINION DELIVERED BY
JUSTICE HOLMES, ON OCTOBER 31,
1927, HELD THAT AN AUTOMOBILE
DRIVER, GOING UPON A RAILROAD
TRACK AT A GRADE CROSSING, DID
SO AT HIS OWN RISK AND THAT THE

RAILROAD COMPANY WAS NOT RESPONSIBLE FOR DAMAGES CLAIMED FOR SUCH
AN ACCIDENT.

THE SUIT WAS BROUGHT BY THE WIDOW AND ADMINISTRATRIX OF
NATHAN GOODMAN AGAINST THE BALTIMORE AND OHIO RAILROAD FOR RUN-
NING HIM DOWN AT A GRADE CROSSING. THE DEFENSE MADE BY THE RAIL-
ROAD COMPANY WAS THAT GOODMAN'S OWN NEGLIGENCE CAUSED HIS DEATH.
AT THE TRIAL, IN THE LOWER COURT, THE RAILROAD COMPANY ASKED THE
COURT TO DIRECT A VERDICT IN ITS FAVOR, BUT THE REQUEST AND OTHERS
LOOKING TO THE SAME END WERE REFUSED, AND MRS. GOODMAN RECEIVED A
JUDGMENT WHICH WAS AFFIRMED BY THE UNITED STATES CIRCUIT COURT OF
APPEALS. 10 F (2d) 58. THE RAILROAD COMPANY THEN APPEALED THE
CASE TO THE UNITED STATES SUPREME COURT.

THE SUPREME COURT IN REVERSING THE JUDGMENT OF THE LOWER
COURT - JUSTICE SUTHERLAND BEING ABSENT - RENDERED THE FOLLOWING
OPINION: "GOODMAN WAS DRIVING AN AUTOMOBILE TRUCK IN AN EASTERLY
DIRECTION AND WAS KILLED BY A TRAIN RUNNING SOUTHWESTERLY ACROSS
THE ROAD AT A RATE OF NOT LESS THAN SIXTY MILES AN HOUR. THE
LINE WAS STRAIGHT BUT IT IS SAID BY THE RESPONDENT THAT GOODMAN
'HAD NO PRACTICAL VIEW' BEYOND A SECTION HOUSE TWO HUNDRED AND
FORTY-THREE FEET NORTH OF THE CROSSING UNTIL HE WAS ABOUT TWENTY
FEET FROM THE FIRST RAIL, OR, AS THE RESPONDENT ARGUES, TWELVE
FEET FROM DANGER, AND THAT THEN THE ENGINE WAS STILL OBSCURED
BY THE SECTION HOUSE. HE HAD BEEN DRIVING AT THE RATE OF TEN
OR TWELVE MILES AN HOUR BUT HAD CUT DOWN HIS RATE TO FIVE OR SIX
MILES AT ABOUT FORTY FEET FROM THE CROSSING. IT IS THOUGHT THAT
THERE WAS AN EMERGENCY IN WHICH, SO FAR AS APPEARS, GOODMAN DID
ALL THAT HE COULD.

"WE DO NOT GO INTO FURTHER DETAILS AS TO GOODMAN'S PRECISE
SITUATION, BEYOND MENTIONING THAT IT WAS DAYLIGHT AND THAT HE WAS
FAMILIAR WITH THE CROSSING, FOR IT APPEARS TO US PLAIN THAT NOTHING

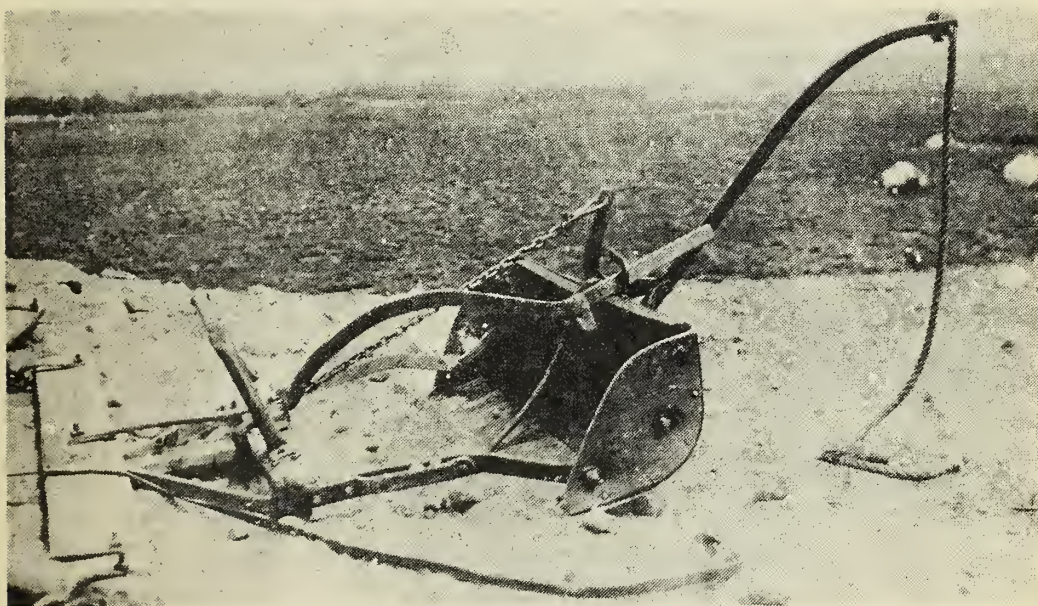
IS SUGGESTED BY THE EVIDENCE TO RELIEVE GOODMAN FROM RESPONSIBILITY FOR HIS OWN DEATH. WHEN A MAN GOES UPON A RAILROAD TRACK HE KNOWS THAT HE GOES TO A PLACE WHERE HE WILL BE KILLED IF A TRAIN COMES UPON HIM BEFORE HE IS CLEAR OF THE TRACK. HE KNOWS THAT HE MUST STOP FOR THE TRAIN, NOT THE TRAIN STOP FOR HIM. IN SUCH CIRCUMSTANCES IT SEEMS TO US THAT IF A DRIVER CANNOT BE SURE OTHERWISE WHETHER A TRAIN IS DANGEROUSLY NEAR HE MUST STOP AND GET OUT OF HIS VEHICLE, ALTHOUGH OBVIOUSLY HE WILL NOT OFTEN BE REQUIRED TO DO MORE THAN TO STOP AND LOOK. IT SEEMS TO US THAT IF HE RELIES UPON NOT HEARING THE TRAIN OR ANY SIGNAL AND TAKES NO FURTHER PRECAUTION HE DOES SO AT HIS OWN RISK. IF AT THE LAST MOMENT GOODMAN FOUND HIMSELF IN AN EMERGENCY IT WAS HIS OWN FAULT THAT HE DID NOT REDUCE HIS SPEED EARLIER OR COME TO A STOP. IT IS TRUE AS SAID IN FLANNELLY V. DELAWARE & HUDSON CO., 225 U. S. 597, 603, THAT THE QUESTION OF DUE CARE VERY GENERALLY IS LEFT TO THE JURY. BUT WE ARE DEALING WITH A STANDARD OF CONDUCT, AND WHEN THE STANDARD IS CLEAR IT SHOULD BE LAID DOWN ONCE FOR ALL BY THE COURTS. SEE SOUTHERN PACIFIC CO. V. BERKSHIRE, 254 U.S. 415, 417, 419."

REBUILT FRESNO EFFECTIVE FOR LOOSE-ROCK HAUL

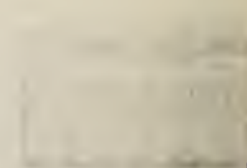
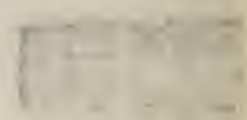
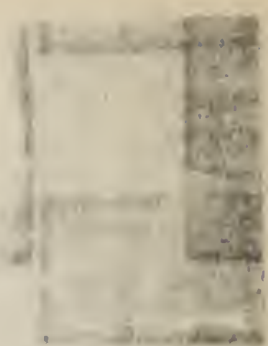
COMPILED FROM A REPORT SUBMITTED BY JOHN D. SLYE OF DISTRICT 3.

A REBUILT FRESNO FOR HAULING LOOSE ROCK WAS FOUND TO BE AN EFFECTIVE PIECE OF EQUIPMENT IN THE GRADING WORK ON WYOMING FEDERAL-AID PROJECT No. 159-0. IN THIS 10-MILE JOB THERE WERE TWO CUTS IN WHICH BOWLDERS AND LOOSE ROCKS PREDOMINATED. AFTER THE MATERIAL WAS LOOSENED, IT WAS FOUND TO BE DIFFICULT TO LOAD IT INTO THE ORDINARY FRESNOES BECAUSE THE SCRAPERS WOULD SLIDE AND JUMP OVER THE LOOSE ROCK BEFORE THEY WERE FULLY LOADED.

TO OVERCOME THIS TENDENCY, THE CONTRACTOR IN CHARGE OF THE WORK REBUILT A NUMBER OF THE FRESNOES AS SHOWN IN THE ACCOMPANYING PHOTOGRAPH. THE PRINCIPAL FEATURE OF THE REBUILT EQUIPMENT CONSISTS OF A CURVED IRON BAR FASTENED TO THE WOODEN FRAME WITH A SWIVEL BOLT AND EXTENDING TO THE BACK OF THE FRESNO PAN. THERE IS ALSO A CHAIN FASTENED TO THE FRAME AND JOINED TO A POST FIXED TO THE PAN. THE FUNCTION OF THE BAR IS TO PREVENT THE PAN FROM TIPPING FORWARD DURING THE LOADING OPERATION WHILE THE CHAIN HOLDS THE PAN IN POSITION AND DOES AWAY WITH THIS PART OF THE WORK FORMERLY ACCOMPLISHED BY THE TEAMSTER. THE WORK OF RECONSTRUCTING THE FRESNO WAS DONE ENTIRELY BY THE CAMP BLACKSMITH.



Views of the loaded and unloaded rebuilt fresno which moved loose rock and boulders efficiently on a Wyoming Federal-aid grading project



THE LOADED FRESNO IS SHOWN IN THE PHOTOGRAPH. WHEN THE UNLOADING POSITION IS REACHED, THE BAR IS DISENGAGED FROM THE CATCH AND SWUNG AROUND A QUARTER TURN, THEN THE CHAIN IS DETACHED AND THE FRESNO IS DUMPED IN THE USUAL MANNER. A NUMBER OF THE RESULT FRESNOES WERE IN OPERATION WHEN THE PICTURES WERE TAKEN AND WERE MOVING THE CLASSIFIED MATERIAL EFFICIENTLY. APPROXIMATELY 4,000 CUBIC YARDS OF BOWLDERS AND LOOSE ROCK HAD BEEN MOVED FROM ONE CUT.

STATUS OF U. S. HIGHWAY MARKERS AND SIGNS

CONTRIBUTED BY F. W. MILLS OF THE DIVISION OF DESIGN

(NOT FOR RELEASE)

ON SEPTEMBER 1, NINETEEN STATES HAD COMPLETED THE ERECTION OF THE NUMBERED MARKERS AND THE DANGER AND MISCELLANEOUS SIGNS ON ALL SECTIONS OF THE UNITED STATES HIGHWAYS. THESE WERE: GEORGIA, INDIANA, IOWA, KANSAS, MAINE, MASSACHUSETTS, MICHIGAN, MINNESOTA, MISSOURI, NEBRASKA, NEW HAMPSHIRE, NORTH CAROLINA, OHIO, OKLAHOMA, VERMONT, WASHINGTON, WEST VIRGINIA, WISCONSIN, AND WYOMING. IN ADDITION TO THESE COMPLETE INSTALLATIONS, SIX STATES - ALABAMA, COLORADO, MISSISSIPPI, NEW MEXICO, OREGON, AND RHODE ISLAND HAD FINISHED THE INSTALLATION OF THE NUMBERED U. S. SHIELDS, AND TWO STATES - TENNESSEE AND VIRGINIA - HAD COMPLETED THE CAUTION AND MISCELLANEOUS SIGNING. THIS INFORMATION IS BASED UPON ANSWERS RECEIVED FROM QUESTIONNAIRES SENT TO THE STATE HIGHWAY DEPARTMENTS ON AUGUST 5, 1927. THE DETAILED ANSWERS ARE GIVEN IN THE FOLLOWING TABLE:

STATE	: SHIELD : : MARKERS : : ERECTED :	: CAUTION AND : : MISCELLANEOUS : : SIGNS ERECTED :	: EXPECT TO COM- : : PLETE SHIELD : : MARKING :	: EXPECT TO COM- : : PLETE MISCELLA- : : NEOUS SIGNING :
	: PER CENT :	PER CENT	:	:
ALABAMA	: 100 :	-	: -	: -
ARIZONA	: 5 :	5	: JAN. 1, 1929	: JAN. 1, 1929
ARKANSAS	: 90 :	50	: SEPT. 1, 1928	: DEC. 31, 1928
CALIFORNIA	: - :	-	: DURING 1927-28	
COLORADO	: 100 :	50	: -	: JUNE 1, 1928
CONNECTICUT	: 30 :	30	: JULY 1, 1928	: JULY 1, 1928
DELAWARE	: - :	-	: NO ACTION TAKEN	
FLORIDA	: - :	90	: -	: -

(CONTINUED FROM PRECEDING PAGE)

STATE	: SHIELD : : MARKERS : : ERECTED :	: CAUTION AND : : MISCELLANEOUS : : SIGNS ERECTED :	: EXPECT TO COM- : : PLETE SHIELD : : MARKING :	: EXPECT TO COM- : : PLETE MISCELLA- : : NEOUS SIGNING :
	: PER CENT :	: PER CENT :	:	:
GEORGIA	: 100 :	: 100 :	: - :	: - :
IDAHO	: 60 :	: 40 :	: NOV. 1, 1927 :	: JULY 1, 1928 :
ILLINOIS	: - :	: - :	: DURING FALL OF 1927. :	:
INDIANA	: 100 :	: 100 :	: - :	: - :
IOWA	: 100 :	: 100 :	: - :	: - :
KANSAS	: 100 :	: 100 :	: - :	: - :
KENTUCKY	: 59 :	: 64 :	: - :	: - :
LOUISIANA	: - :	: - :	: CADO PARISH MARKED BY LOCAL AUTHOR- :	: (ITY :
MAINE	: 100 :	: 100 :	: - :	: - :
MARYLAND	: - :	: - :	: FALL OF 1927 :	: - :
MASSACHUSETTS	: 100 :	: 100 :	: - :	: - :
MICHIGAN	: 100 :	: 100 :	: - :	: - :
MINNESOTA	: 100 :	: 100 :	: - :	: - :
MISSISSIPPI	: 100 :	: - :	: - :	: NOW UNDER CONTRACT :
MISSOURI	: 100 :	: 100 :	: - :	: - :
MONTANA	: - :	: - :	: - :	: - :
NEBRASKA	: 100 :	: 100 :	: - :	: - :
NEVADA	: 50 :	: 60 :	: DEC. 1, 1927 :	: DEC. 1, 1927 :
NEW HAMPSHIRE	: 100 :	: 100 :	: - :	: - :
NEW JERSEY	: - :	: - :	: HAS NOT RECOGNIZED SYSTEM :	:
NEW MEXICO	: 100 :	: - :	: - :	: DEC. 31, 1927 :
NEW YORK	: - :	: - :	: USE OWN STANDARDS :	:
NORTH CAROLINA	: 100 :	: 100 :	: - :	: - :
NORTH DAKOTA	: 85 :	: 85 :	: - :	: - :
OHIO	: 100 :	: 100 :	: - :	: - :
OKLAHOMA	: 100 :	: 100 :	: - :	: - :
OREGON	: 100 :	: 20 :	: - :	: - :
PENNSYLVANIA	: - :	: - :	: - :	: - :
RHODE ISLAND	: 100 :	: 98 :	: - :	: - :
SOUTH CAROLINA	: 60 :	: 70 :	: DEC. 1, 1927 :	: DEC. 1, 1927 :
SOUTH DAKOTA	: 80 :	: - :	: DEC. 31, 1927 :	: DEC. 31, 1927 :
TENNESSEE	: - :	: 100 :	: JUNE 1, 1928 :	: - :
TEXAS	: - :	: - :	: - :	: - :
UTAH	: - :	: - :	: PROJECT STATEMENT SUBMITTED :	:
VERMONT	: 100 :	: 100 :	: - :	: - :
VIRGINIA	: - :	: 100 :	: - :	: - :
WASHINGTON	: 100 :	: 100 :	: - :	: - :
WEST VIRGINIA	: 100 :	: 100 :	: - :	: - :
WISCONSIN	: 100 :	: 100 :	: - :	: - :
WYOMING	: 100 :	: 100 :	: - :	: - :

YADKIN RIVER BRIDGE TEST PROGRESSING

CONTRIBUTED BY A. L. GEMENY OF THE DIVISION OF TESTS

(NOT FOR RELEASE)

THE FIRST PHASE OF THE TESTS OF THE BRIDGE OVER THE YADKIN RIVER BETWEEN ALBEMARLE AND MT. GILEAD, N. C., - INVOLVING THE STRUCTURE AS IT STANDS - IS NOW COMPLETED. TESTS ON THE SECOND PHASE WITH THE CONTINUITY OF THE SUPERSTRUCTURE DESTROYED WILL BE MADE SHORTLY.

THE PURPOSE OF THE STRESS MEASUREMENTS IS TO DETERMINE THE MANNER IN WHICH A FULL-SIZED CONCRETE ARCH, BUILT UNDER NORMAL CONDITIONS, DEFORMS UNDER DETERMINATE LOADS, AND TO COMPARE THESE DEFORMATIONS AND THE STRESSES PRODUCED IN THE ARCH RIB WITH THE DEFORMATIONS AND STRESSES AS COMPUTED BY THE GENERALLY ACCEPTED ELASTIC THEORY OF ARCHES AND THOSE DERIVED FROM THE TESTS OF MODELS BY MEANS OF THE BEGGS DEFORMETER GAGES.

PROCEDURE. - THE LOADS ARE IMPOSED BY MEANS OF TANKS OF WATER PLACED AT ALL POSSIBLE POSITIONS ON THE SPAN. THESE TANKS ARE MADE OF WOOD, 42 BY 20 BY 18 FEET INSIDE DIMENSIONS, AND WEIGH, WHEN FULL, 160 TONS EACH.

THE EXPERIMENT IS DIVIDED INTO THE FOLLOWING PHASES:

1. - A COMPLETE SERIES OF LOADS ON THE BRIDGE AS IT STANDS; USING ONE LOADING TANK.
2. - A COMPLETE SERIES OF LOADS ON THE BRIDGE WITH THE CONTINUITY OF THE SUPERSTRUCTURE DESTROYED, SO AS TO APPROACH AS NEAR AS POSSIBLE TO THE CONDITIONS GENERALLY ASSUMED IN DESIGNING ARCHES; USING ONE LOADING TANK.
3. - LOADING THE BRIDGE IN THE MOST CRITICAL POSITIONS, WITH TWO TANKS, IN AN EFFORT TO CRIPPLE THE ARCH RIB.

THE TANKS ARE WEIGHED BY MEANS OF THE DEFORMATION OF SUPPORTING COPPER CYLINDERS SET IN STEEL CYLINDERS AND RECEIVING THE LOAD FROM CLOSELY-FITTING PISTONS. SPECIALLY ANNEALED COPPER CYLINDERS (1/2 INCH BY 1/2 INCH), ACCURATELY SHAPED, ARE PLACED IN THE CELLS SO THAT THEY CARRY THE ENTIRE WEIGHT OF THE TANK PLACED ON THE PISTONS. THE WEIGHT, A FUNCTION OF THE DEFORMATION

OF THE COPPER CYLINDERS, IS TAKEN FROM CALIBRATION CURVES PREVIOUSLY DETERMINED IN THE LABORATORY. BY THIS MEANS THE EMPTY-TANK WEIGHT OF 47,000 POUNDS WAS CHECKED WITHIN 300 POUNDS OF THE COMPUTED WEIGHT AND OTHER CHECK MEASUREMENTS.

MEASUREMENTS. - THE FOLLOWING MEASUREMENTS ARE TAKEN FOR EACH OF THE FIRST TWO PHASES OF THE EXPERIMENT, WITH THE LOAD PLACED IN ALL POSSIBLE POSITIONS, AND THREE INCREMENTS OF WATER FOR EACH POSITION.

1. - THE DEFORMATION OF THE CONCRETE AND STEEL AT 24 POINTS ON THE ARCH RIB. FROM THESE MEASUREMENTS THE STRESS IS DETERMINED BY THE USE OF THE MODULUS OF ELASTICITY DERIVED FROM TESTS OF SPECIMENS TAKEN FROM THE BRIDGE.

INSTRUMENT. - THE DEFORMATION IS MEASURED BY ELECTRIC TELEMETERS WHICH ARE DESIGNED ON THE PRINCIPLE THAT THE ELECTRICAL RESISTANCE OF A CARBON PILE VARIES WITH THE PRESSURE ON THE PILE. THE INSTRUMENT IS ATTACHED TO STEEL PLUGS GROUTED IN THE CONCRETE ARCH RIB SO THAT THE DEFORMATION MOVEMENTS ARE TRANSMITTED AS PRESSURES UPON THE CARBON PILES. THE TELEMETERS ARE READ TO ONE TEN-THOUSANDTH OF AN INCH AND ESTIMATED TO ONE HUNDRED-THOUSANDTH OF AN INCH.

2. - THE ANGULAR ROTATION OF THE AXIS OF THE BRIDGE AT 3 POINTS.

INSTRUMENT. - THIS MEASUREMENT IS MADE BY MEANS OF A CLINOMETER, CONSISTING OF A STEEL BAR CARRYING A LEVEL BUBBLE AND LEVELING SCREW ATTACHED TO A DIAL READING TO ONE-THOUSANDTH OF AN INCH. THE INSTRUMENT IS PLACED AND LEVELED ON GAGE POINTS LOCATED 20 INCHES APART ON STEEL PLUGS IN THE ARCH RIB. THE RELATIVE DISPLACEMENT OF THE GAGE POINTS IS MEASURED, AND FROM THESE MEASUREMENTS THE ANGULAR ROTATION UNDER ANY INCREMENT OF LOAD IS DERIVED DIRECTLY.

3. - THE CHANGE IN THE LENGTH OF THE MIDDLE ORDINATES OF 5-FOOT ARCS OF THE AXIS AT 5-FOOT INTERVALS OVER THE ENTIRE LENGTH OF THE ARCH RIB.

INSTRUMENT. - THE MIDDLE-ORDINATE CHANGES ARE MEASURED BY MEANS OF A RADIUS METER. THIS INSTRUMENT CONSISTS OF A STEEL BAR 5 FEET LONG, CARRYING AT ITS CENTER A FEDERAL DIAL READING TO ONE TEN-THOUSANDTH OF AN INCH. GAGE POINTS AT THE ENDS OF



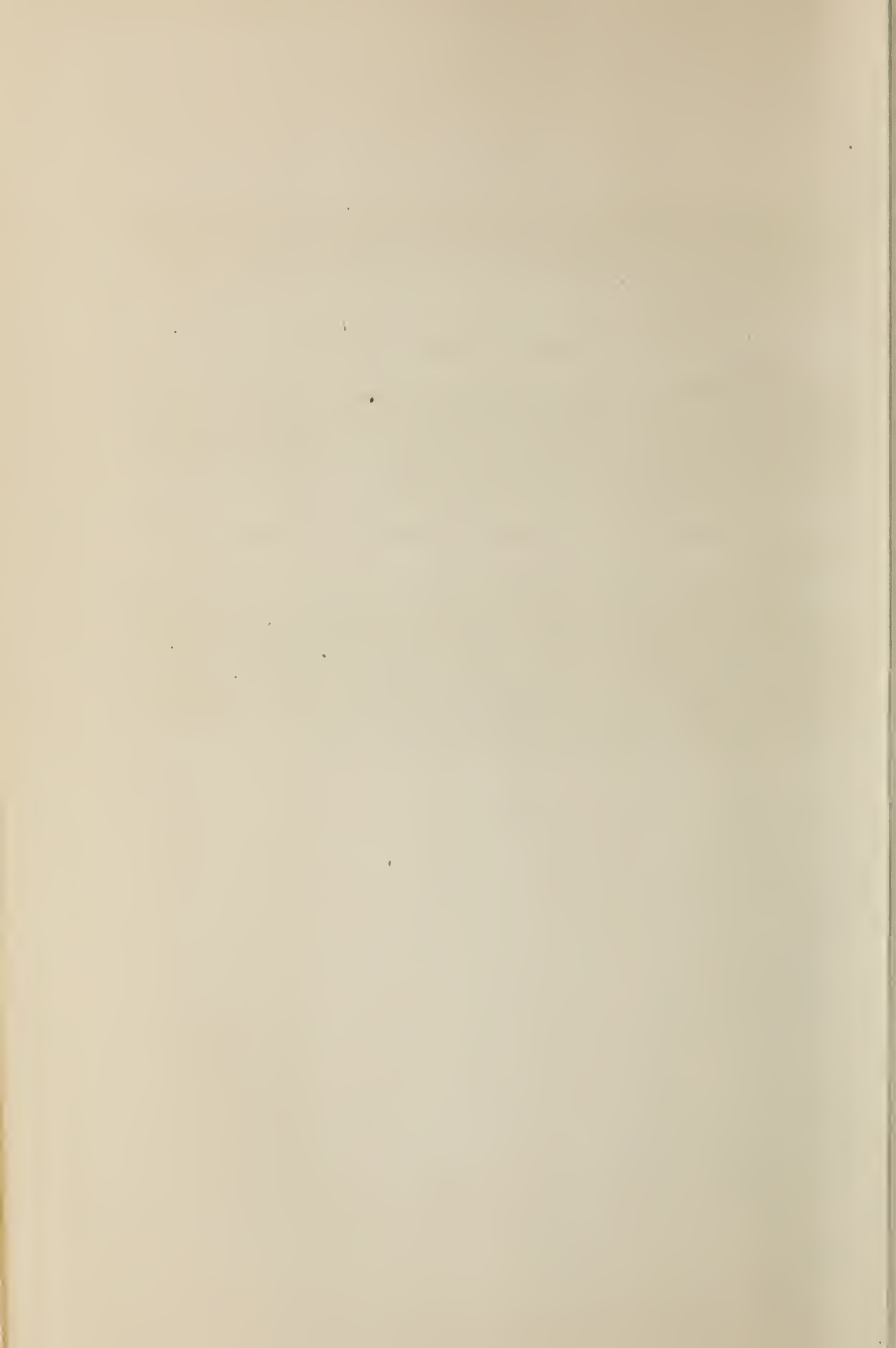
THE RADIUS METER ARE PLACED ON CORRESPONDING POINTS ON STEEL PLUGS IN THE ARCH AND THE NEEDLE OF THE DIAL IS ALLOWED TO REST ON THE SURFACE OF A SQUARE STEEL PLUG HALFWAY BETWEEN THE GAGE POINTS. THE MOVEMENTS OF THE SQUARE PLUG ARE TRANSFERRED TO THE NEEDLE AND READ ON THE DIAL.

4. - DEFLECTIONS AT EACH SPANDREL POINT OF THE ARCH.

INSTRUMENT. - THE DEFLECTIONS ARE MEASURED FROM A WIRE SUSPENDED OVER A PULLEY WITH A COUNTER WEIGHT AT ONE END TO MAINTAIN A CONSTANT TENSION AND SAG. POINTS ARE LOCATED IN THE CONCRETE AT THE TOP OF EACH SPANDREL COLUMN AND THE DEFLECTIONS ARE MEASURED FROM THESE POINTS TO THE WIRE.

5. - ROTATION OF THE PIERS AT THE END OF THE SPAN UNDER OBSERVATION.

INSTRUMENT. - THE PIER ROTATIONS ARE MEASURED BY CLINOMETERS IN THE SAME MANNER AS THE AXIAL ROTATIONS, THE GAGE POINTS BEING PLACED ON THE TOP OF EACH PIER. THESE ROTATION MEASUREMENTS ARE CHECKED BY MEANS OF TWO WIRES PLACED 5 FEET APART VERTICALLY AND SUSPENDED INDEPENDENTLY OF THE SPAN UNDER OBSERVATION. MOVEMENTS ARE SHOWN BY THE RELATIVE LONGITUDINAL DISPLACEMENTS OF FIXED POINTS, ON THE WIRES AND ON THE ENDS OF THE PIERS.



UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS

MA-1/2 (1ST. HALF 1927)
R. S. A.

MOTOR VEHICLE REGISTRATION AND RECEIPTS
FOR FIRST HALF YEAR, 1927

STATES AND DISTRICT OF COLUMBIA	GRAND TOTAL 1927 MOTOR VEHICLES AND TRAILERS	MOTOR VEHICLES REGISTERED, INDIVIDUALLY AND COMMERCIALLY OWNED, PASSENGER AUTOMOBILES AND TRUCKS AND TRAILERS	OTHER REGISTERED VEHICLES	TAX- EXEMPT OFFICIAL VEHICLES	TOTAL GROSS RECEIPTS	DISPOSITION OF GROSS RECEIPTS (Approximately Allocated When Not Itemized)					1928 GRAND TOTAL MOTOR VEHICLE REGISTRATION	COMPARATIVE INCREASE OF 1927 REGISTRATION OVER 1926 (312 MONTHS) 3/ PER CENT	STATES AND DISTRICT OF COLUMBIA
						COLLECTION AND ADMI- NISTRATION	STATE HIGHWAYS	LOCAL ROADS	COUNTY, STATE AND OTHER ROAD BODIES	FOR OTHER PURPOSES			
ALABAMA	211,386	184,059	27,326	1,061	2,853,482	\$ 100,819	\$ 1,112,080	\$ 558,379	\$ 1,092,224	13,763	7.0	ALABAMA	
ARIZONA	99,599	10,000	1,000	280	4,405,443	37,863	183,433	183,433	-	64,185	9.5	ARIZONA	
ARKANSAS	1,594,723	1,356,884	237,839	1,430	7,682,541	5,113,952	3,061,850	3,061,850	3,061,850	125,155	Decrease 0.9	ARKANSAS	
CALIFORNIA	216,031	216,031	18,763	77	1,435,773	71,939	8,174,232	682,467	682,467	9,984	4.0	CALIFORNIA	
COLORADO	282,035	222,627	39,408	2,862	8,174,232	-	8,174,232	-	-	23,008	9.8	COLORADO	
CONNECTICUT	34,705	34,705	8,079	204	1,755,699	-	775,699	-	-	2,481	8.1	CONNECTICUT	
DELAWARE	374,732	374,732	5,873	1,069	3,510,513	589,647	3,655,050	1,295,018	1,295,018	7/	Decrease 0.5	DELAWARE	
FLORIDA	215,009	215,009	5,873	1,069	3,061,850	3,061,850	3,061,850	3,061,850	3,061,850	275,510	9.8	FLORIDA	
GEORGIA	89,008	81,181	7,846	133	1,351,966	1,351,966	1,351,966	1,351,966	1,351,966	94,161	6.8	GEORGIA	
IDAHO	1,386,060	1,182,286	173,774	3,063	9,471,787	190,573	9,471,998	1,216,787	1,216,787	1,217,285	12.2	IDAHO	
ILLINOIS	745,000	641,881	103,119	5,318	9,027,737	150,573	4,837,146	4,837,146	4,837,146	590,704	25.8	ILLINOIS	
INDIANA	650,888	610,416	40,472	1,500	9,377,714	228,367	3,173,182	-	-	433,551	7.8	INDIANA	
IOWA	250,885	227,771	23,114	2,000	3,458,153	3,458,153	3,458,153	3,458,153	3,458,153	247,104	3.0	IOWA	
KANSAS	214,595	207,771	6,824	535	4,093,126	78,700	3,954,306	438,971	438,971	218,500	Decrease 1.0	KANSAS	
KENTUCKY	210,000	178,500	31,500	450	3,954,306	101,944	1,804,256	-	-	13,139	10.2	KENTUCKY	
LOUISIANA	119,261	22,344	97	886	2,244,145	168,038	2,000,000	-	-	180,000	9.9	LOUISIANA	
MAINE	249,883	239,882	10,001	547	2,439,514	168,038	2,000,000	2,071,476	2,071,476	17,881	9.9	MAINE	
MARYLAND	697,404	547,479	62,370	1,339	7,500,000	1,001,000	2,071,476	2,071,476	2,071,476	25,439	6.8	MARYLAND	
MASSACHUSETTS	1,607,732	1,331,421	276,311	7,075	9,529,425	2,067,223	915,574	915,574	915,574	32,340	Decrease 0.7	MASSACHUSETTS	
MICHIGAN	1,041,482	901,651	139,831	4,639	16,049,507	259,336	7,550,117	5,392,426	5,392,426	99,404	5.0	MICHIGAN	
MINNESOTA	607,725	533,427	74,298	2,838	9,589,621	9,589,621	9,589,621	9,589,621	9,589,621	574,358	33.6	MINNESOTA	
MISSISSIPPI	187,881	178,093	15,788	1,339	2,439,514	168,038	2,000,000	-	-	180,000	9.9	MISSISSIPPI	
MISSOURI	91,701	78,398	13,303	118	1,020,380	38,647	915,574	915,574	915,574	52,340	0.7	MISSOURI	
MONTANA	324,169	297,747	26,422	1,300	3,318,189	941,729	742,938	742,938	742,938	329,648	Decrease 0.7	MONTANA	
NEBRASKA	22,457	17,858	4,599	58	208,768	11,481	87,181	130,097	130,097	20,327	9.4	NEBRASKA	
NEW HAMPSHIRE	66,618	76,200	10,418	477	1,055,768	87,000	938,768	938,768	938,768	76,639	9.7	NEW HAMPSHIRE	
NEW JERSEY	49,315	49,315	1,241	109	1,132,556	111,817	3,114,300	3,114,300	3,114,300	76,979	9.7	NEW JERSEY	
NEW MEXICO	1,704,997	1,421,562	283,435	5,635	28,852,931	447,107	20,593,961	148,738	148,738	46,571	8.6	NEW MEXICO	
NORTH CAROLINA	119,271	381,318	36,933	1,276	2,452,152	5,894,448	3,890,631	6,833,954	6,833,954	1,562,492	142.95	NORTH CAROLINA	
NORTH DAKOTA	1,435,845	1,299,636	136,209	8,284	2,452,152	170,000	4,536,747	566,947	566,947	371,333	10.3	NORTH DAKOTA	
OHIO	459,429	415,929	43,500	835	5,300,000	4,382,102	4,382,102	4,382,102	4,382,102	184,939	6.9	OHIO	
OKLAHOMA	204,895	189,756	15,139	1,509	5,822,214	125,000	2,120,000	3,120,000	3,120,000	18,499	4.2	OKLAHOMA	
OREGON	1,425,424	1,241,247	184,177	3,319	22,955,010	614,555	22,024,698	1,449,304	1,449,304	9,254	4.7	OREGON	
PENNSYLVANIA	1,031,133	897,000	134,133	42	10,494,000	1,000,000	9,494,000	9,494,000	9,494,000	1,326,882	7.4	PENNSYLVANIA	
RHODE ISLAND	137,171	137,171	17,200	1,176	1,974,239	12,450	1,961,789	-	-	6,311	15.5	RHODE ISLAND	
SOUTH CAROLINA	152,069	138,855	13,214	169	2,346,854	46,837	1,713,427	1,128,490	1,128,490	22,695	2.4	SOUTH CAROLINA	
SOUTH DAKOTA	285,849	243,443	42,406	643	3,451,235	41,544	3,409,749	3,409,749	3,409,749	99,442	7.4	SOUTH DAKOTA	
TENNESSEE	550,110	833,881	283,771	6,980	14,235,439	674,793	8,633,676	4,727,580	4,727,580	277,775	Decrease 2.4	TENNESSEE	
TEXAS	84,450	72,927	11,523	432	1,003,771	132,000	869,771	869,771	869,771	48,000	5.1	TEXAS	
UTAH	259,359	259,359	43,566	285	1,946,833	87,441	4,782,892	4,782,892	4,782,892	60,889	3.2	UTAH	
VIRGINIA	348,628	299,639	48,989	1,923	4,849,633	87,141	4,782,892	-	-	22,789	8.2	VIRGINIA	
WASHINGTON	205,121	182,816	22,305	282	5,672,974	88,172	4,550,968	337,934	337,934	326,500	6.8	WASHINGTON	
WEST VIRGINIA	626,452	546,384	80,068	391	3,525,284	2,235,685	2,235,685	2,235,685	2,235,685	21,333	11.8	WEST VIRGINIA	
WISCONSIN	46,198	40,822	5,376	106	8,951,068	640,000	6,000,000	3,221,068	3,221,068	580,797	8.0	WISCONSIN	
WYOMING	91,973	80,163	11,810	914	344,531	-	285,931	861,779	861,779	85,857	2.2	WYOMING	
DISTRICT OF COLUMBIA	20,991,333	18,414,767	2,576,566	86,789	12,452,068	\$ 188,525,679	\$ 47,537,941	\$ 21,795,330	\$ 1,408,925	19,818,755	7.0	DISTRICT OF COLUMBIA	
TOTALS	20,991,333	18,414,767	2,576,566	86,789	12,452,068	\$ 188,525,679	\$ 47,537,941	\$ 21,795,330	\$ 1,408,925	19,818,755	7.0	TOTALS	

NOTES: 1/ REGISTRATION SHOWN FOR 8 MONTHS IN ALL STATES EXCEPT NORTH CAROLINA WHICH REGISTRATION YEAR ENDS JUNE 30TH.
2/ SOME STATES REPORT OCCURRENCES UNDER PREVIOUS YEAR'S REGISTRATION YEAR. POSSIBLY THE NON-RESIDENT REGISTRATIONS AND RE-REGISTRATIONS OF SAME VEHICLE.
3/ INTEREST AND RETIREMENT PAYMENTS ON STATE ROAD BONDS EXCEPT BY PARAGRAPHS FOLLOWED BY "INCREASE".
4/ ON STATE ROAD BONDS \$82,611, REMAINDER ON COUNTY ROAD BONDS.
5/ FORMERLY REPORTED AS 407,777. THE REVISED FIGURE ELIMINATES NON-RESIDENT REGISTRATIONS INCLUDED IN 1926 DATA.
6/ FOR BELLMORE CITY STREET.
7/ FOR BELLMORE CITY STREET.
8/ FOR BELLMORE CITY STREET.
9/ FOR BELLMORE CITY STREET.
10/ FOR BELLMORE CITY STREET.
11/ INCLUDES \$1,000,000 FOR BRIDGE AND TUNNEL COMMISSION.
12/ FOR AUTO-THIEF BUREAU.
13/ FORMERLY REPORTED AS 490,000.
14/ TRAILERS INCLUDED WITH TRUCKS.
15/ INCLUDES REVENUE FROM WHICH STREET APPROPRIATIONS ARE MADE FOR DISTRICT OF COLUMBIA.
16/ TO U. S. TREASURY FROM WHICH STREET APPROPRIATIONS ARE MADE FOR DISTRICT OF COLUMBIA.
17/ REVISED TOTAL DUE TO REVISIONS IN FLORIDA AND OKLAHOMA AS NOTED.

1

1/2

1/3

1/4

1/5

1/6

1/7

1/8

1/9

1/10

1/11

1/12

1/13

1/14

1/15

1/16

1/17

1/18

1/19

1/20

1/21

1/22

1/23

1/24

1/25

1/26

1/27

1/28

1/29

1/30

1/31

1/32

1/33

1/34

1/35

1/36

1/37

1/38

1/39

1/40

1/41

1/42

1/43

1/44

1/45

1/46

1/47

1/48

1/49

1/50

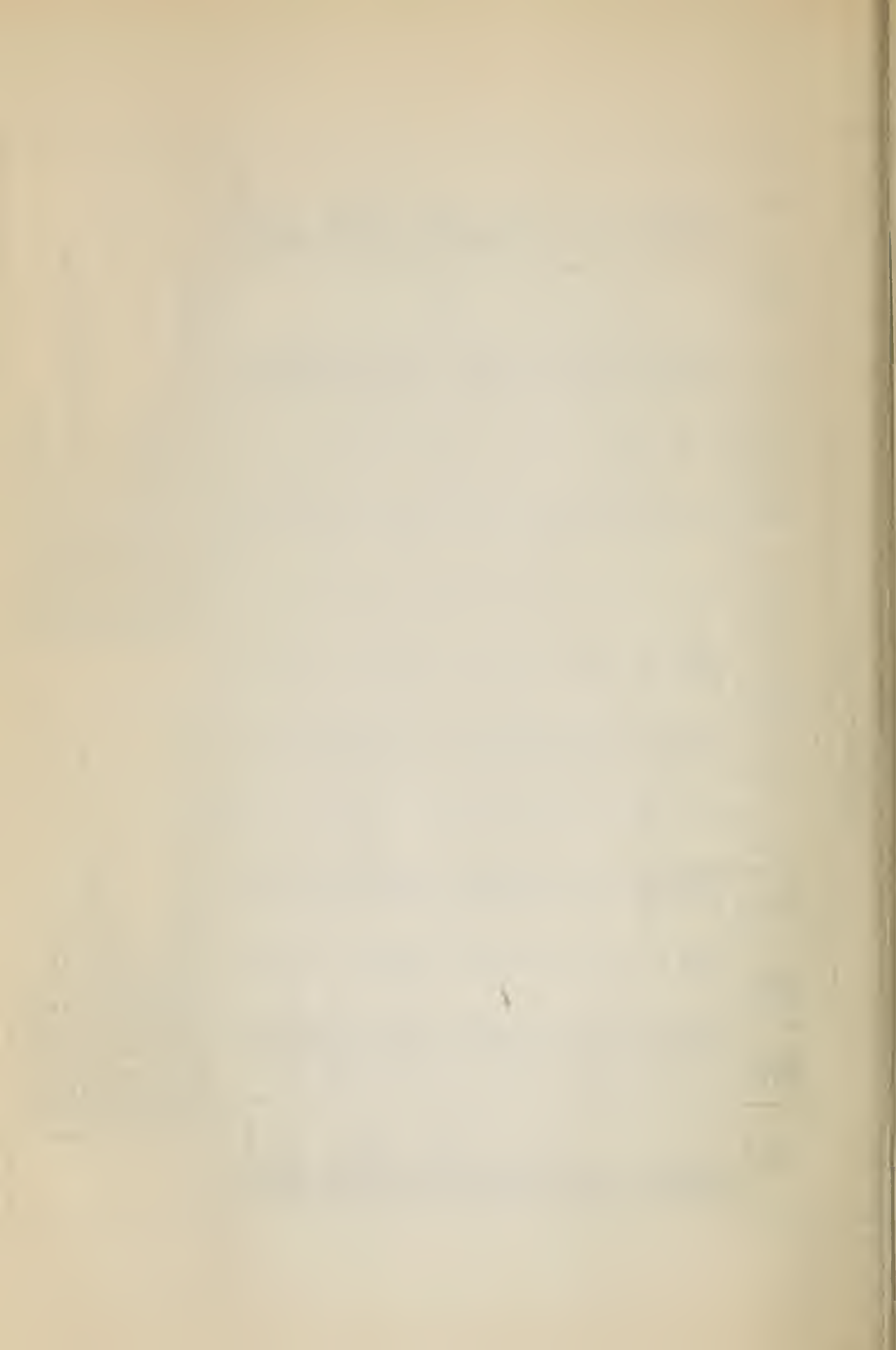
GASOLINE TAXES FOR FIRST HALF YEAR, 1927

G-1/2 (1st. HALF, 1927)
R. S. A.

TOTAL TAXES EARNED ON MOTOR VEHICLE FUEL, REFUNDS ON GROSS TAX, DISPOSITION OF FUND, RATES, AND GALLONS OF GASOLINE CONSUMED BY MOTOR VEHICLES TAXED

STATES AND DISTRICT OF COLUMBIA	GROSS TAX REFUNDS	EXEMPTION (GROSS FROM TAX)	TOTAL TAX EARNED ON FUEL FOR MOTOR VEHICLES	DISPOSITION OF TOTAL GASOLINE TAX EARNINGS 1/			STATE AND COUNTY ROAD PAYMENTS	FOR MISCELLANEOUS PURPOSES	TAX RATES, 6 MONTHS 1927	NET GALLONS OF GASOLINE TAXED AND USED BY MOTOR VEHICLES	ESTIMATED ADDITIONAL GALLONS (NOT TAXED) USED BY MOTOR VEHICLES	STATES AND DISTRICT OF COLUMBIA
				COLLECTED (HALF YEAR)	CONSTRUCTION & MAINTENANCE STATE	CONSTRUCTION & MAINTENANCE LOCAL						
ALABAMA	\$ 2,653,637	-	\$ 2,653,637	\$ 10,302	\$ 1,300,778	\$ 1,342,557	-	-	2 4	66,096,599	-	ALABAMA
ARIZONA	662,723	144,130	518,593	-	259,300	259,293	-	-	3 3	17,286,541	-	ARIZONA
ARKANSAS	1,741,088	180,527	1,560,561	46,817	358,829	171,661	3/ \$ 993,152	-	4 5	39,013,981	-	ARKANSAS
CALIFORNIA	9,371,452	841,408	8,530,044	19,918	4,508,008	4,508,208	-	-	2 2	451,795,261	-	CALIFORNIA
COLORADO	1,307,024	43,422	1,263,602	5/	1,300,359	433,718	-	-	3 5/1	57,701,371	-	COLORADO
CONNECTICUT	1,307,024	-	1,307,024	-	1,267,091	-	-	-	2 2	65,231,153	-	CONNECTICUT
DELAWARE	273,203	6,112	267,091	-	2,100	1,338,279	-	-	3 3/4	133,880,422	-	DELAWARE
FLORIDA	5,355,213	-	5,355,213	2,100	2,192,443	876,960	-	-	3 3/4	37,757,535	-	FLORIDA
GEORGIA	3,071,328	30,679	3,040,649	5,203	601,451	-	-	-	0 0 1/2	15,750,489	-	GEORGIA
ILLINOIS	637,373	-	637,373	7,398	3,038,209	1,519,104	-	-	3 3	152,157,038	-	ILLINOIS
INDIANA	4,697,156	132,395	4,564,761	14,718	2,654,725	1,024,355	13/1,000,000	-	2 2	251,689,674	-	INDIANA
IOWA	2,865,433	88,256	2,777,177	15/	2,274,327	1,068,244	16/	63,246	2 2	115,891,613	-	IOWA
KANSAS	2,171,014	326,069	1,844,945	9/	1,924,076	1,848,151	-	-	4 4	51,826,287	-	KANSAS
KENTUCKY	1,471,552	-	1,471,552	2,415	1,640,500	250,745	-	-	2 2	94,562,249	-	KENTUCKY
LOUISIANA	1,411,552	-	1,411,552	12/	2,415,155	-	-	-	3 3	70,359,016	-	LOUISIANA
MAINE	761,073	18,148	742,925	5,341	1,368,792	368,792	-	-	3 3	24,461,721	-	MAINE
MARYLAND	1,831,689	57,257	1,774,432	1,250	1,418,554	-	12/ \$ 354,638	-	4 4/1	57,069,042	-	MARYLAND
MASSACHUSETTS	5,414,065	380,267	5,033,798	14,718	2,654,725	1,024,355	13/1,000,000	-	0 0	148,200,000	-	MASSACHUSETTS
MICHIGAN	2,367,545	93,218	2,274,327	15/	2,274,327	1,068,244	16/	63,246	2 2	115,891,613	-	MICHIGAN
MINNESOTA	2,136,296	47,023	2,089,273	1,800	1,003,006	1,068,244	-	-	4 4	51,826,287	-	MINNESOTA
MISSISSIPPI	2,968,138	15,023	2,953,115	24,011	2,897,046	-	-	-	2 2	146,053,264	-	MISSISSIPPI
MISSOURI	1,477,472	7,408	1,470,064	3,639	1,456,425	-	-	-	3 1/1	73,503,208	-	MISSOURI
MONTANA	217,604	18,107	199,497	-	99,748	99,748	-	-	2 2	4,987,419	-	MONTANA
NEBRASKA	421,366	7,785	413,581	-	413,581	-	-	-	4 4	18,310,415	-	NEBRASKA
NEVADA	19,400	-	19,400	11,590	602,810	-	-	-	0 0 1/2	14,081,758	-	NEVADA
NEW HAMPSHIRE	19,400	-	19,400	11,590	602,810	-	-	-	3 3	14,081,758	-	NEW HAMPSHIRE
NEW JERSEY	4,108,331	176,987	3,931,344	8,218	1,705,745	-	15/2,218,561	-	0 0	98,313,580	-	NEW JERSEY
NEW MEXICO	1,722,220	182,384	1,539,836	7,239,122	4,735,600	1,272,300	20/1,507,336	-	0 0	318,902,142	-	NEW MEXICO
NORTH CAROLINA	3,208,634	12,256	3,196,378	4,149	2,130,919	1,065,457	-	-	5 5/25	110,282,328	-	NORTH CAROLINA
NORTH DAKOTA	1,690,893	77,684	1,613,209	21/	1,609,060	1,065,457	-	-	3 3	54,084,297	-	NORTH DAKOTA
OKLAHOMA	6,101,696	-	6,101,696	21/	4,067,797	2,033,899	-	-	3 3	305,084,825	-	OKLAHOMA
OREGON	326,848	25,877	300,971	23/	253,953	47,018	-	-	2 2	25,335,311	-	OREGON
PENNSYLVANIA	2,214,215	3,579	2,210,636	24/	1,360,754	845,842	-	-	5 5	44,212,717	-	PENNSYLVANIA
RHODE ISLAND	1,085,630	115,000	970,630	2,783	1,957,847	-	-	-	3 3	32,616,933	-	RHODE ISLAND
SOUTH CAROLINA	1,583,153	-	1,583,153	15,831	4,481,265	-	-	-	3 3	66,104,639	-	SOUTH CAROLINA
SOUTH DAKOTA	5,375,794	-	5,375,794	5,375	212,419	-	25/1,533,888	-	3 3/15	16,212,768	-	SOUTH DAKOTA
TENNESSEE	1,734,804	103,378	1,631,426	29/	2,081,679	1,040,839	-	-	6 1/1	12,120,292	-	TENNESSEE
TEXAS	275,536	176,167	97,369	275,536	1,631,226	-	-	-	3 3	81,561,285	-	TEXAS
UTAH	3,298,685	103,378	3,195,307	3,122,518	1,631,226	-	-	-	4 4	59,259,098	-	UTAH
VERMONT	1,458,314	42,257	1,416,057	30/	1,416,057	-	-	-	2 2	40,458,768	-	VERMONT
VIRGINIA	2,619,397	92,339	2,526,058	32/	1,085,000	1,441,058	30/	-	3 3/1	126,302,901	-	VIRGINIA
WASHINGTON	257,275	367	256,908	35/	256,908	-	-	-	2 2	9,244,481	-	WASHINGTON
WISCONSIN	551,405	2,900	548,505	-	-	-	31/ 506,605	-	3 1/1	27,450,267	-	WISCONSIN
WYOMING	-	-	-	-	-	-	-	-	-	-	-	WYOMING
DIST. OF COLUMBIA	-	-	-	-	-	-	-	-	-	-	-	DIST. OF COLUMBIA
TOTALS	-	-	\$ 101,250,841	\$ 204,663	\$ 69,616,088	\$ 22,843,566	\$ 4,598,751	\$ 3,987,773	168 2-35	3,971,423,311	947,700,000	TOTALS

- NOTES:
- 1/ DISPOSITION DATA IS ESTIMATED IN SOME CASES, AND IS APPROXIMATELY ALLOCATED ACCORDING TO MOTOR FUEL LAWS OF THE VARIOUS STATES.
 - 2/ THIS TOTAL TAX SHOWS THE ACTUAL AVAILABLE AMOUNT FOR DISPOSAL, AND EXCLUDES REFUNDS.
 - 3/ ON STATE HIGHWAY BONDS, \$78,028; REMAINDER ON DISTRICT ROAD BONDS.
 - 4/ NEW 3 CENT TAX EFFECTIVE JULY 1, 1927.
 - 5/ NEW 5 CENT TAX EFFECTIVE JULY 1, 1927.
 - 6/ NEW 3 CENT TAX EFFECTIVE JULY 1, 1927.
 - 7/ NEW 5 CENT TAX EFFECTIVE JULY 1, 1927.
 - 8/ NEW 3 CENT TAX EFFECTIVE JULY 1, 1927.
 - 9/ PAID FROM STATE GENERAL FUND, \$4,500.
 - 10/ COLLECTION COST OF \$3,750 FROM LEGISLATIVE APPROPRIATION.
 - 11/ ASSIGNED TO BALTIMORE CITY, INCLUDES \$31,435 FOR ELIMINATION OF GRADE CROSSINGS.
 - 12/ NEW 3 CENT TAX EFFECTIVE SEPTEMBER 4, 1927.
 - 13/ COLLECTION COSTS, \$2,300 FROM INSPECTION OIL FUND.
 - 14/ FOR BEAMALL TO PROTECT HIGHWAY; COLLECTED BY AN EXTRA TAX OF 2 CENTS IN HARRISON COUNTY AND 1 CENT IN HANCOCK COUNTY.
 - 15/ NEW 2 CENT TAX EFFECTIVE JULY 1, 1927.
 - 16/ NEW 2 CENT TAX EFFECTIVE JULY 1, 1927.
 - 17/ NEW 4 CENT TAX EFFECTIVE JULY 1, 1927.
 - 18/ APPROPRIATION BY STATE OF \$5,000 FOR HALF YEAR.
 - 19/ ASSIGNED BY LAW FOR USE ON WASHINGTON STREETS.
 - 20/ EXCLUDES \$600 COSTS NOT CHARGED TO TAX.
 - 21/ INCLUDES \$ 4,402 FOR LICENSE FEES FOR GASOLINE DISTRIBUTING STATIONS.
 - 22/ APPROXIMATED BY PRO-RATING MOTOR VEHICLE FEES AND GASOLINE TAXES FOR INTEREST ON ROAD BONDS.
 - 23/ FOR MAINTENANCE OF STREETS IN MUNICIPALITIES.
 - 24/ NEW 3 CENT TAX EFFECTIVE JULY 1, 1927.
 - 25/ LEGISLATIVE APPROPRIATION \$5,000 FOR THE YEAR.
 - 26/ STATE APPROPRIATION OF \$5,000 FOR THE YEAR.
 - 27/ NEW 4 CENT TAX EFFECTIVE JULY 1, 1927.
 - 28/ FOR FREE SCHOOL FUND.
 - 29/ NOT AVAILABLE FOR ROAD USE UNTIL 1928.
 - 30/ ON STATE ROAD BONDS.
 - 31/ \$ PAID FROM APPROPRIATION FROM STATE REVENUES.
 - 32/ INTEREST OF STATE ROAD BONDS CHARGEABLE TO THIS FUND BUT COLLECTED COSTS.
 - 33/ AMOUNTS NOT REPORTED.
 - 34/ NEW 4 CENT TAX EFFECTIVE JULY 1, 1927.
 - 35/ APPROPRIATION BY STATE OF \$5,000 FOR HALF YEAR.
 - 36/ ASSIGNED BY LAW FOR USE ON WASHINGTON STREETS.
 - 37/ EXCLUDES \$600 COSTS NOT CHARGED TO TAX.



NEW TRAFFIC-FLOW RECORDER IN USE ON
CLEVELAND TRAFFIC SURVEY

CONTRIBUTED BY J. G. MCKAY, CHIEF OF THE DIVISION OF
HIGHWAY ECONOMICS, AND L. W. TELLER, DIVISION OF TESTS

(NOT FOR RELEASE)

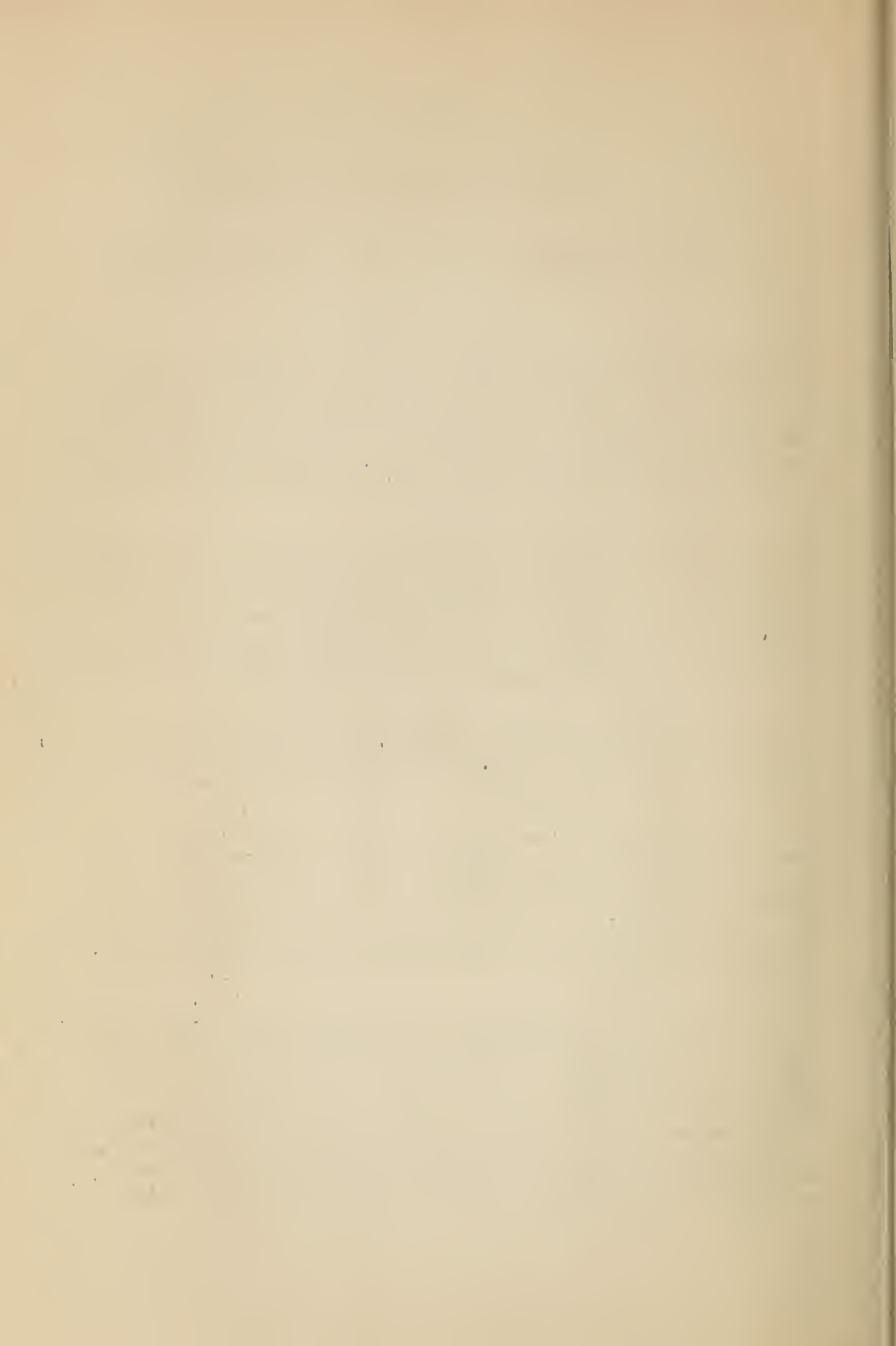
A NEW DEVICE, DESIGNED TO MEASURE AND RECORD THE SPEED OF A VEHICLE AT ANY INSTANT DURING A RUN OR TRIP, AND SIMULTANEOUSLY TO RECORD THE ELAPSED TIME AND DISTANCE SINCE THE BEGINNING OF THE RUN, IS BEING USED BY THE BUREAU IN CONNECTION WITH THE HIGHWAY-PLANNING SURVEY NOW IN PROGRESS IN COOPERATION WITH THE COUNTY COMMISSIONERS OF CUYAHOGA COUNTY, OHIO, IN THE CLEVELAND METROPOLITAN REGION.

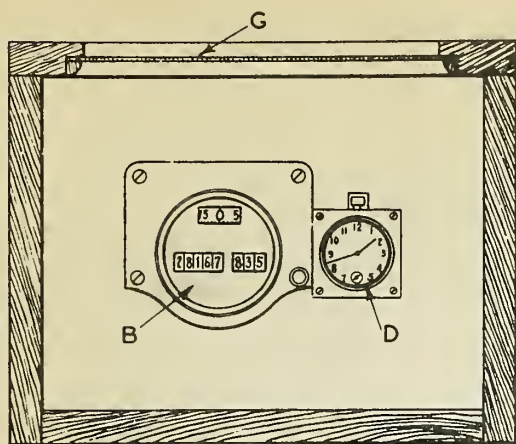
THE DEVICE CONSISTS ESSENTIALLY OF A CLOCK, A SPEEDOMETER, AND AN ODOMETER - THE THREE SO MOUNTED AS TO BE WITHIN THE FIELD OF A MOTION-PICTURE CAMERA WITH WHICH THEY CAN BE PHOTOGRAPHED SIMULTANEOUSLY AT ANY TIME WHEN ILLUMINATED BY TWO FLASH LIGHTS WHICH ALSO FORM A PART OF THE DEVICE. THE ENTIRE APPARATUS IS ENCLOSED IN A BOX APPROXIMATELY TWO FEET LONG AND ONE FOOT SQUARE. A PLAN OF THE DEVICE IS SHOWN IN FIGURE 1.

THE APPARATUS MAY BE INSTALLED IN ANY CAR BY MAKING THE NECESSARY CONNECTION TO THE SPEEDOMETER, AND THE ONLY OTHER EQUIPMENT REQUIRED IS A 6-8 VOLT STORAGE BATTERY TO PROVIDE CURRENT FOR THE FLASH LIGHTS.

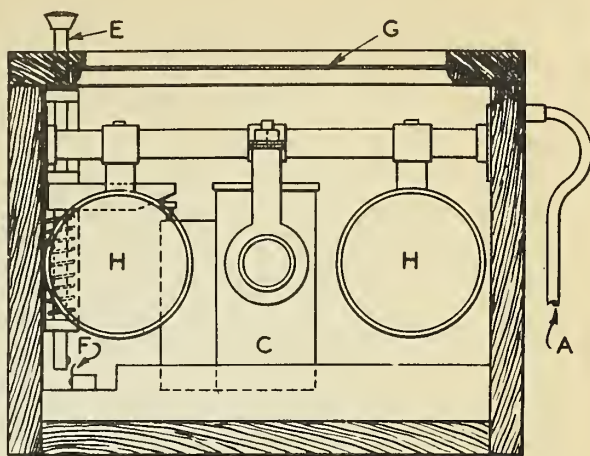
THE OPERATION OF THE INSTRUMENT IS EXTREMELY SIMPLE. A SMALL KNOB ON THE TOP OF THE BOX IS PRESSED WHEN A RECORD IS TO BE MADE. THIS ACTION FIRST TURNS ON THE FLASH LIGHTS AND ALMOST IMMEDIATELY ACTUATES THE CAMERA EXPOSING THE FILM FOR ONE-SIXTIETH OF A SECOND AND MOVING IT FORWARD FOR THE NEXT PICTURE. THE CAMERA IS LOADED WITH 18 FEET OF STANDARD MOTION-PICTURE FILM WHICH PROVIDES FOR 250 EXPOSURES.

INSTALLED IN AN AUTOMOBILE AS ABOVE DESCRIBED, THIS DEVICE IS USED TO MEASURE AND RECORD THE VARIABLE SPEED OF HIGHWAY TRAFFIC BY SO OPERATING THE TEST CAR AS TO "FLOAT" WITH THE TRAFFIC. THE SIMULTANEOUS RECORDS OF TIME, SPEED, AND DISTANCE WHICH CAN BE MADE AT ANY INSTANT DURING A RUN OR WHENEVER THE SPEED OF THE CAR IS CHANGED FOR ANY REASON WILL PROVIDE THE DATA NECESSARY FOR A VARIETY OF STUDIES OF FLOW OF TRAFFIC, THE EFFECT OF TRAFFIC OBSTRUCTIONS AND CONGESTION, THE TIME REQUIRED TO TRAVEL OVER SECTIONS OF A ROUTE, ETC.

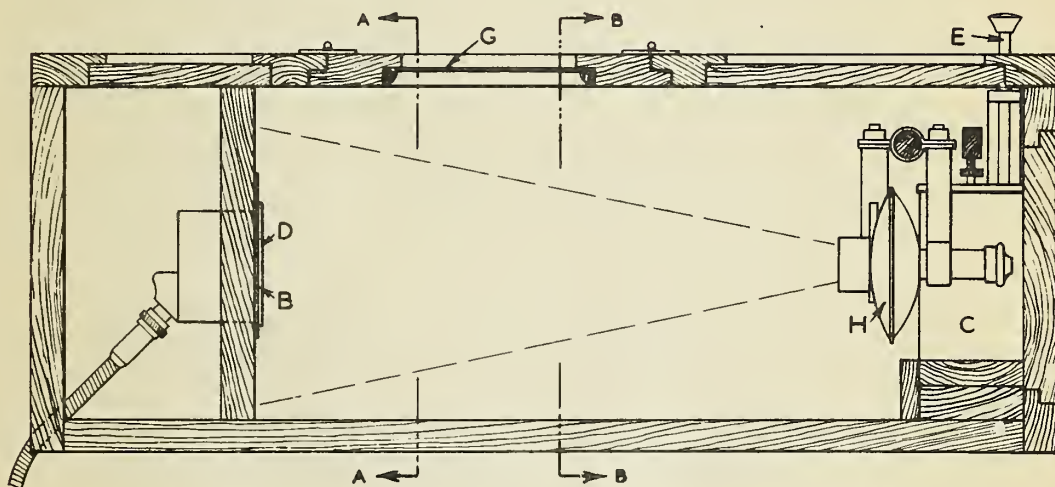




SECTION A-A



SECTION B-B

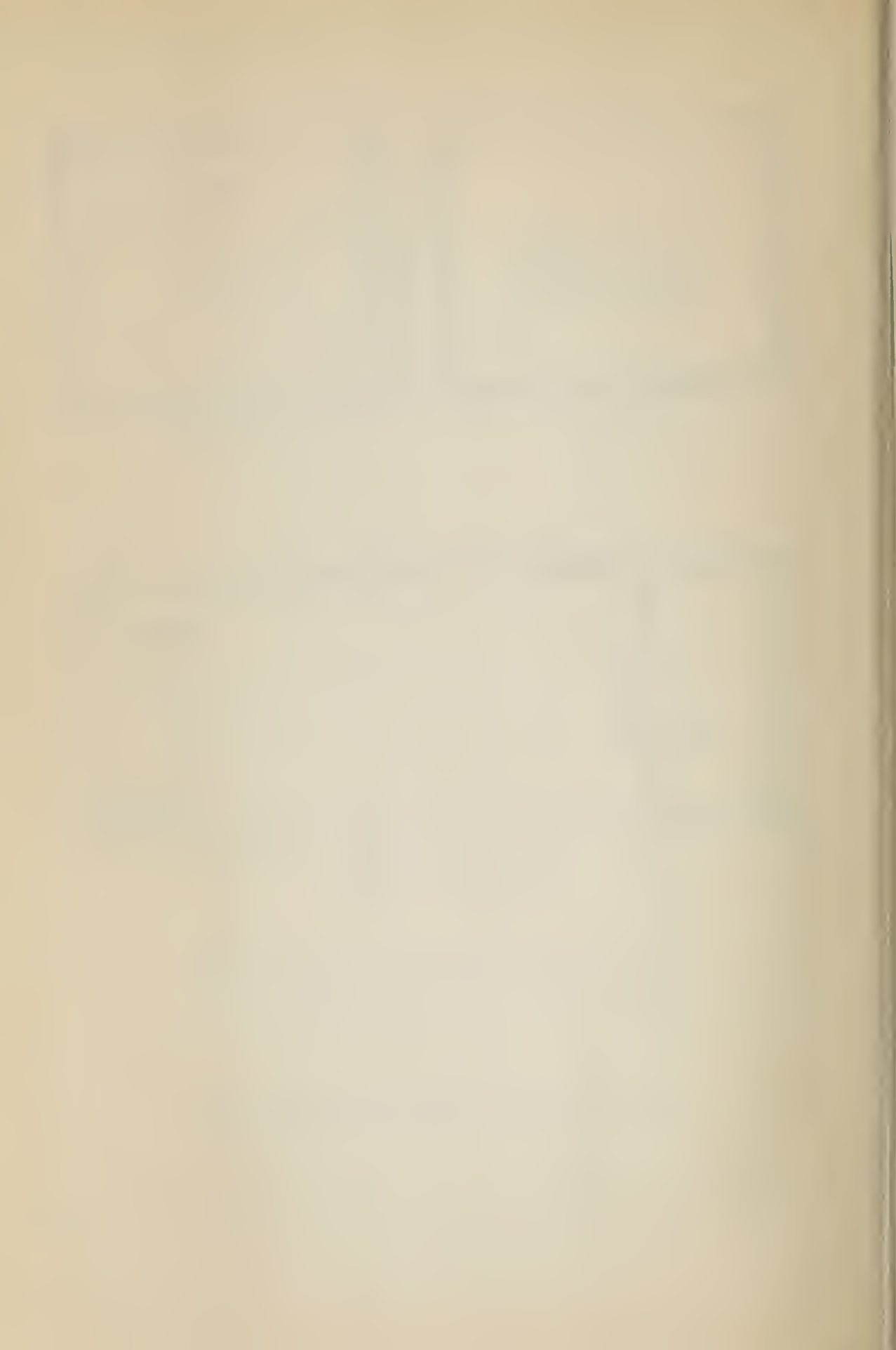


LONGITUDINAL SECTION

A-BATTERY CABLE B-SPEEDOMETER C-CAMERA D-CLOCK

E-OPERATING ROD F-LAMP SWITCH G-WINDOW H-LAMP

FIGURE 1.- SKETCH OF THE NEW SPACE-TIME RECORDER.

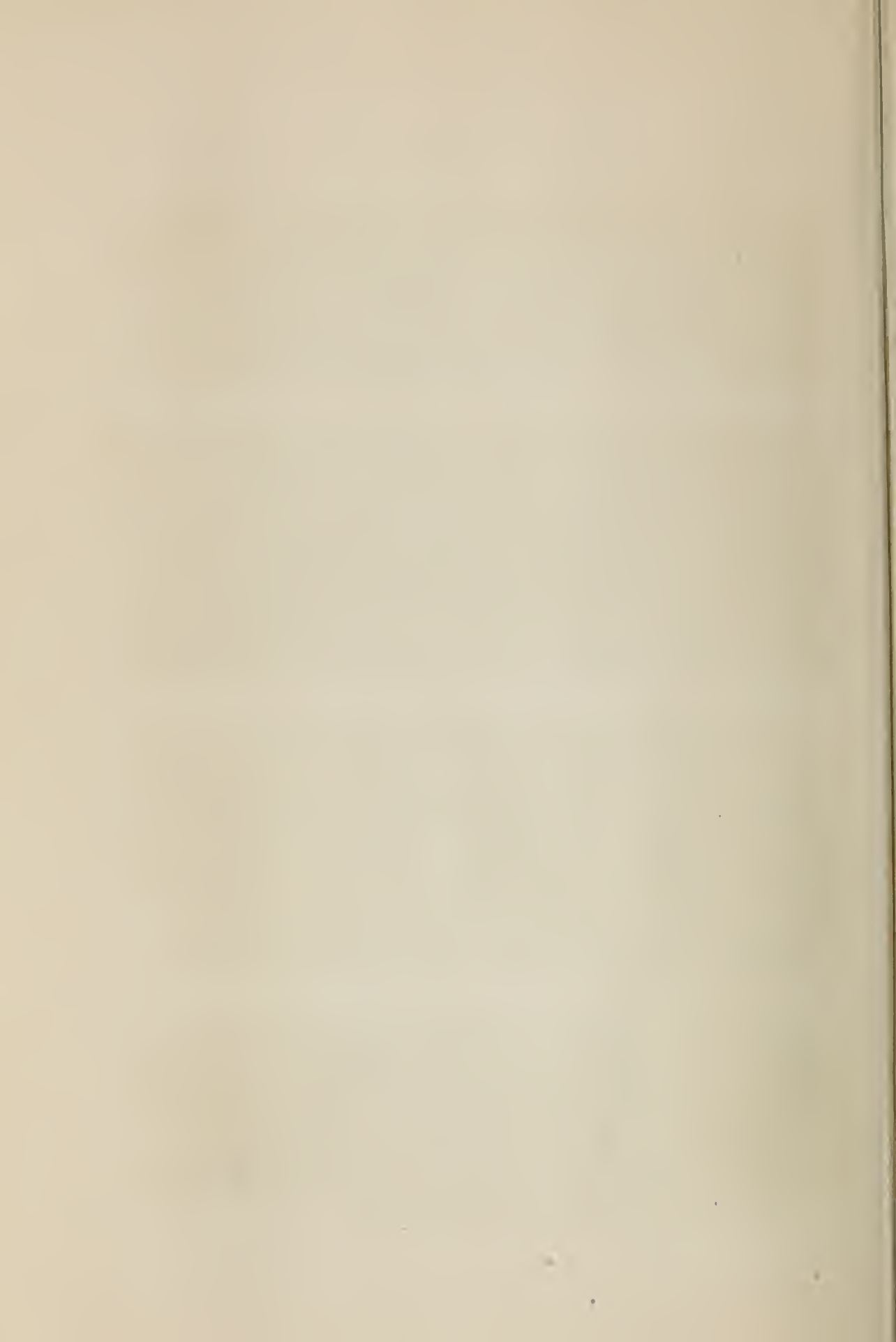


THE OPERATING CREW CONSISTS OF THREE MEN - A DRIVER, AN INSTRUMENT OPERATOR AND OBSERVER, AND A RECORDER. A WINDOW IN THE TOP OF THE INSTRUMENT BOX PERMITS THE OPERATOR AND OBSERVER TO NOTE THE ODOMETER FIGURE AT THE INSTANT OF PHOTOGRAPHIC EXPOSURE, AND THIS FIGURE AND THE REASON FOR THE EXPOSURE ARE GIVEN TO THE RECORDER WHO NOTES THEM ON THE RECORDING FORM. AN ENLARGED REPRODUCTION OF THREE OF THE PHOTOGRAPHIC RECORDS IS SHOWN IN FIGURE 2, AND A SAMPLE RECORD FORM IS SHOWN IN FIGURE 3.

IN MAKING A RUN WITH TRAFFIC, THE INITIAL EXPOSURE IS MADE AT THE INSTANT THE CAR IS PUT IN MOTION, ANOTHER WHEN IT ATTAINS THE PREDETERMINED SPEED, AND OTHERS WHEN IT IS "FLOATING" WITH THE AVERAGE SPEED OF THE TRAFFIC ON THE ROAD. THEREAFTER, OTHER EXPOSURES ARE MADE WHEN FOR ANY REASON THE SPEED IS ALTERED APPRECIABLY. IN THIS MANNER, A SERIES OF PHOTOGRAPHIC RECORDS ARE OBTAINED, WHICH CAN BE USED SUBSEQUENTLY TO DETERMINE THE EFFECT UPON THE SPEED OF THE TEST CAR (AND CONSEQUENTLY OF THE TRAFFIC WITH WHICH IT IS "FLOATED") OF TRAFFIC CONGESTION, SLOW VEHICLES, TRAFFIC LIGHTS, STREET CARS, STREET CAR LOADING PLATFORMS, RAILROAD CROSSINGS, NARROW PAVEMENTS AND BRIDGES, CURVES, GRADES, ETC.

ONE FORM IN WHICH THE DATA THUS OBTAINED MAY BE PLOTTED, FOR PURPOSES OF ANALYSIS, IS SHOWN IN FIGURE 4. IN THIS GRAPH SPEED IS PLOTTED AGAINST DISTANCE, AND EACH UP AND DOWN CHANGE IN THE DIRECTION OF THE GRAPH REPRESENTS A CHANGE IN SPEED OCCURRING AT A PARTICULAR DISTANCE FROM THE STARTING POINT, THE ENTIRE GRAPH CONSTITUTING A RECORD OF THE VARIABLE SPEED OF THE TEST CAR IN OPERATION OVER A SECTION OF HIGHWAY. SUPERIMPOSED UPON THE SPEED RECORD IN THIS CASE, AS AN INDICATION OF THE VARIOUS COMBINATIONS POSSIBLE, IS A RECORD OF THE DENSITY OF TRAFFIC ON THE ROAD AT THE TIME OF THE RUN, THE WIDTH OF THE ROAD SURFACE, AND THE ROUGHNESS OF THE SURFACE AS DETERMINED BY ROUGHOMETER READINGS.

ONE OF THE INTERESTING STUDIES IN CONNECTION WITH THE CLEVELAND SURVEY, FOR WHICH THIS DEVICE IS EMPLOYED, IS THAT OF DETERMINING THE TRAFFIC CAPACITY OF PAVEMENTS OF VARIOUS WIDTHS. A NUMBER OF SECTIONS OF HIGHWAY RANGING IN PAVEMENT WIDTH FROM 18 TO 50 FEET HAVE BEEN SELECTED FOR STUDY. TRAFFIC ON THE SEVERAL SECTIONS VARIES FROM 2,000 TO MORE THAN 30,000 VEHICLES PER DAY AND, IN COMPOSITION, FORMS AN EXCLUSIVELY PASSENGER-CAR MOVEMENT TO A COMBINED PASSENGER-CAR AND TRUCK TRAFFIC IN WHICH THE TRUCKS CONSTITUTE UPWARDS OF 15 PER CENT.



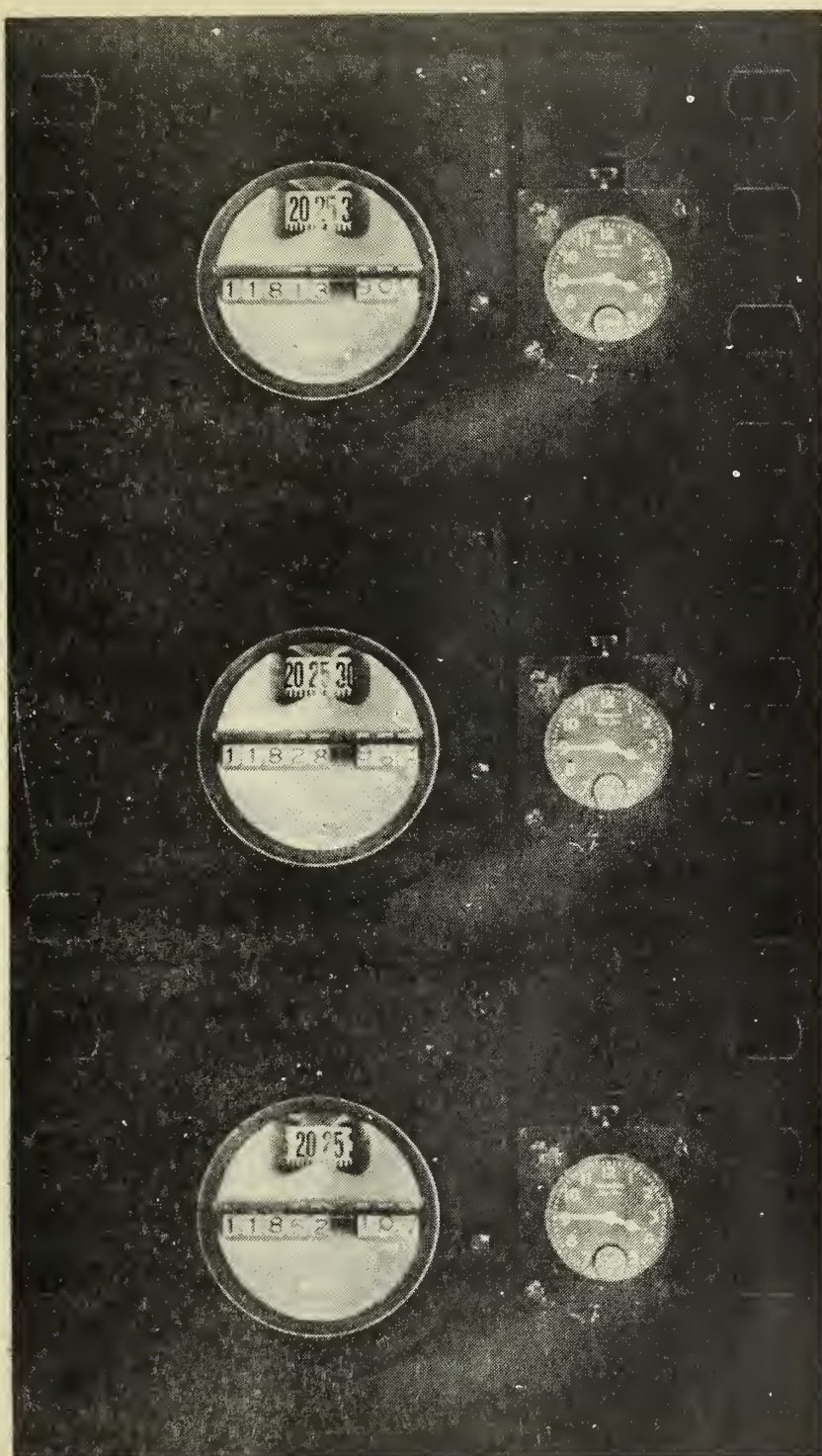
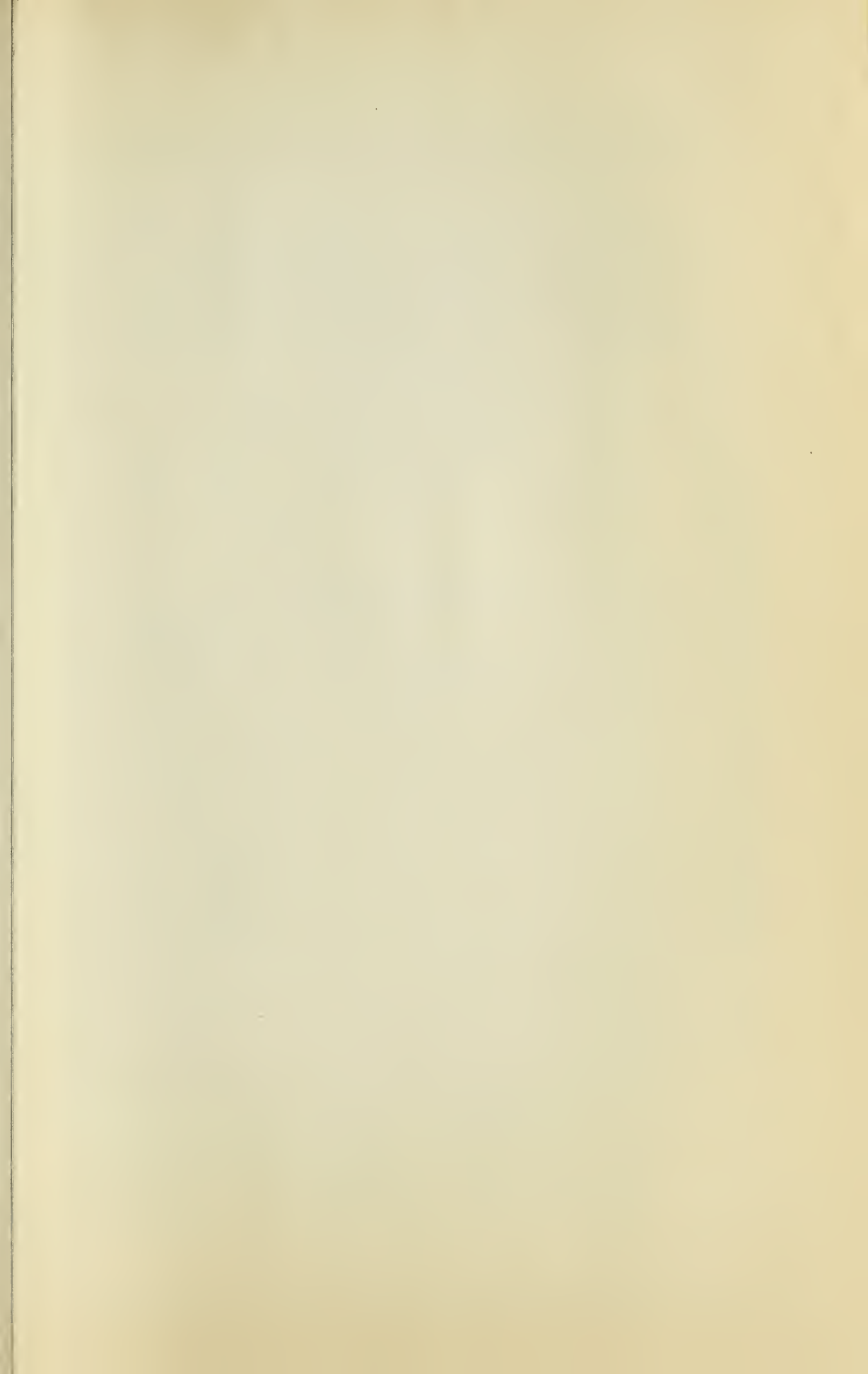


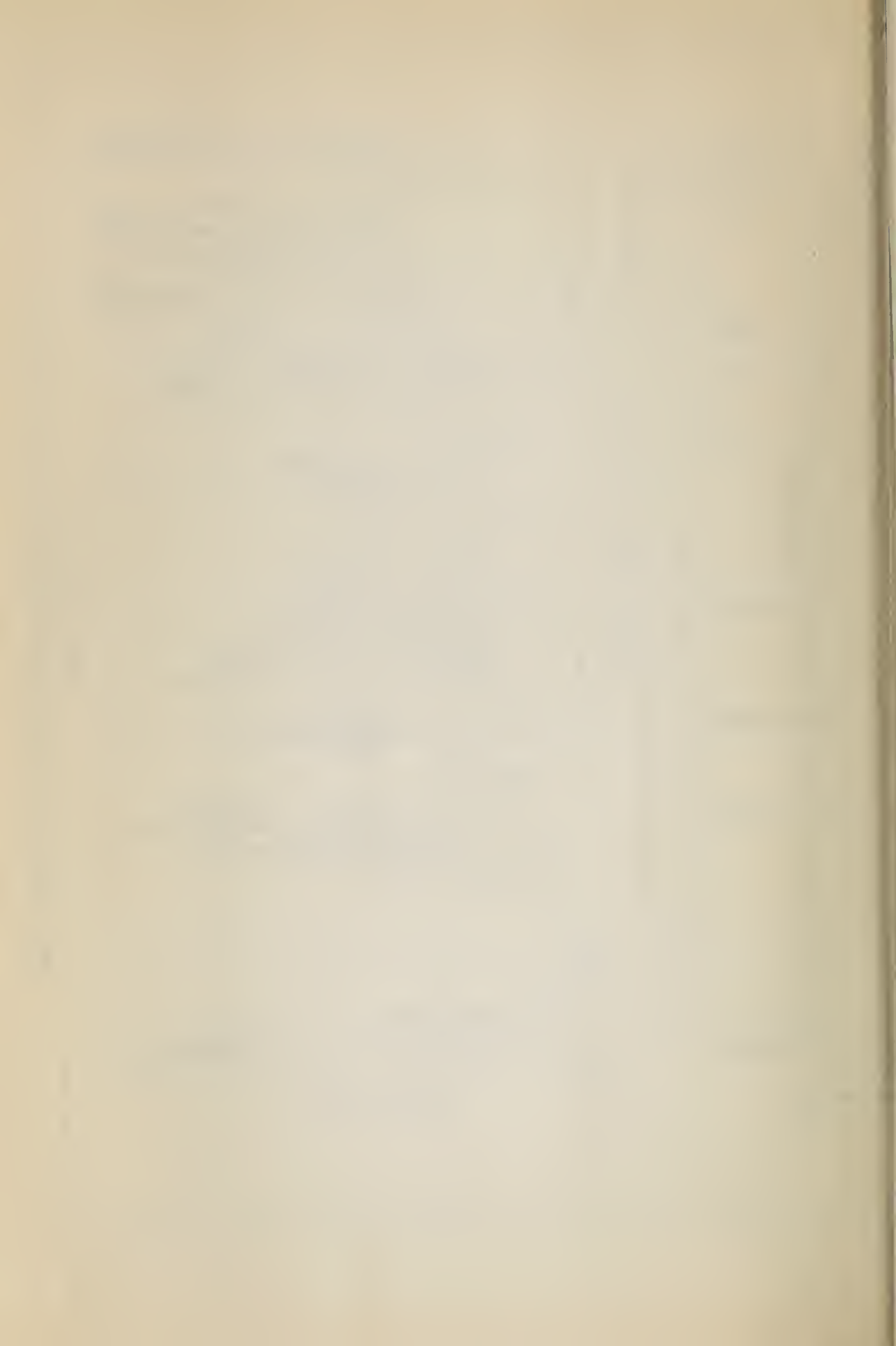
Figure 2. - Enlarged reproduction of a portion of the photographic record



EXPERIMENT NO.	ODOMETER READING	MILES PER HOUR	TIME			LOCATION	MOVEMENT				CAUSE OF CHANGE OF MOVEMENT												MISCELLANEOUS					
			HOURS	MINUTES	SECONDS		START	AVERAGE	AVERAGE PLUS	SLOW	STOP	RIGHT TURN	LEFT TURN	TRAFFIC LIGHT	OFFICER	TROLLEY CAR	VEHICLE CONGESTION	NARROW PAVEMENT	ROUGH PAVEMENT	LOADING PLATFORM	PEDESTRIAN	CURVE		GRADE CROSSING	DETOUR	DETOUR	LANES	
160	117.34	30	2	42	59																							
161	.40	14	3	43	10	Charles																						
162	.62	26	3	43	37																							Road construction
163	.69	18	3	43	56	Snow Road																						Intersection
164	.81	24	3	44	10	Henneth Ave.																						
165	.94	34	3	44	26																							
166	118.12	24	3	44	45	Chest Lake Ave																						
167	.28	25	3	45	06	Christer Pike																						Intersection
168	.52	23	3	45	38	Hillridge																						Ditch
169	.80	25	3	46	12	Brook Park																						Intersection
170	.95	26	3	46	28	W. G. B. road phase																						
171	119.13	33	3	46	48																							
172	.38	34	3	47	15																							
173	.47	27	3	47	29																							
174	.59	35	3	47	44																							
175	.71	39	3	47	55																							

FIGURE 3 - STANDARD FORM USED, OR TABULATING INFORMATION OBTAINED SIMULTANEOUSLY WITH THE RECORD MADE BY THE NEW SPACE-TIME RECORDER.



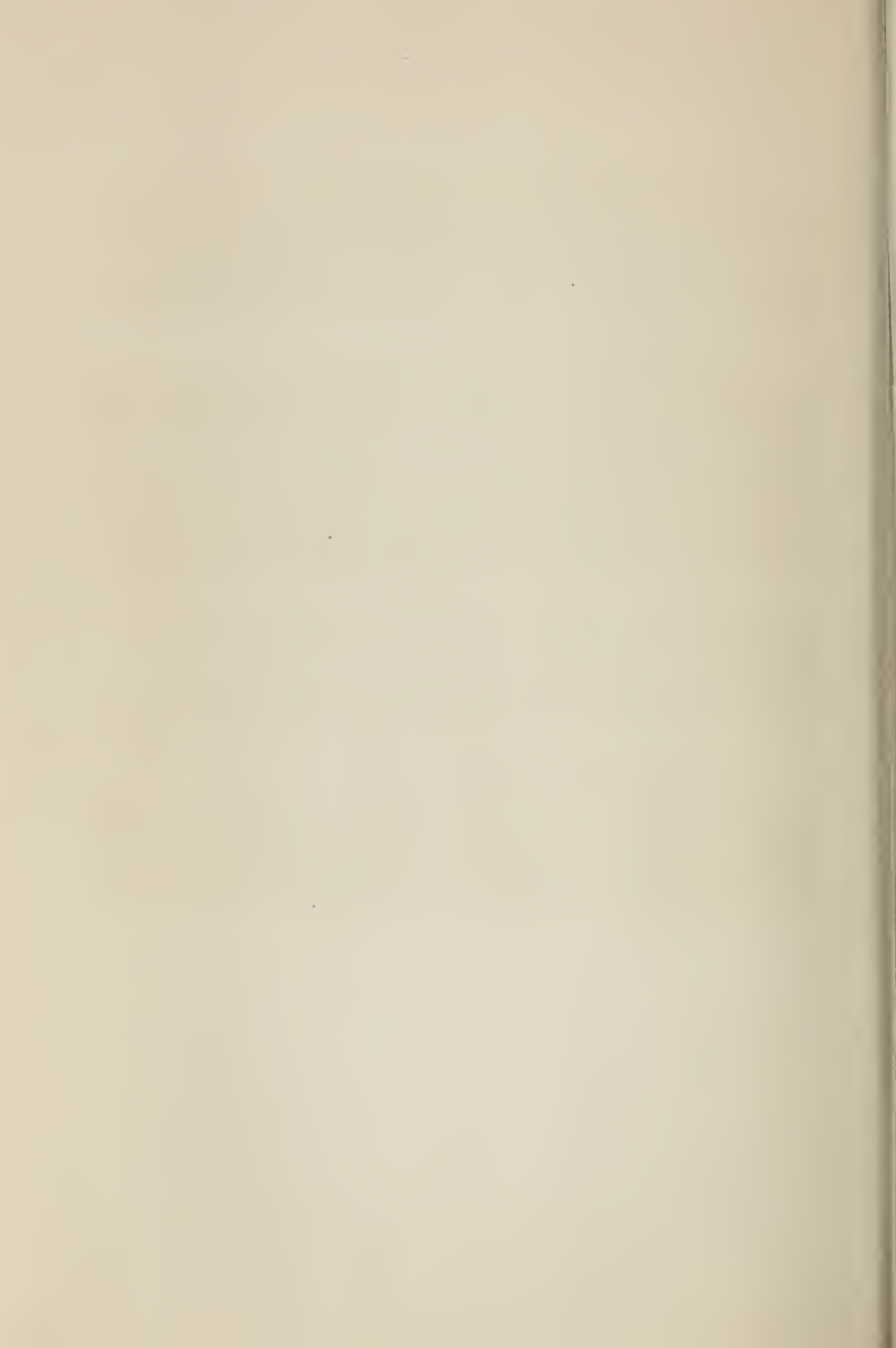


IT IS ASSUMED THAT THE TRAFFIC CAPACITY OF A PAVEMENT OF ANY PARTICULAR WIDTH IS THAT TRAFFIC VOLUME WHICH IT WILL DISCHARGE WITHOUT UNDUE CONGESTION; AND IT IS TAKEN FOR GRANTED THAT CONGESTION IS INVARIABLY REFLECTED IN A RETARDATION OF THE SPEED OF VEHICLES. ACTING ON THESE ASSUMPTIONS AN EFFORT WILL BE MADE TO DETERMINE THE TRAFFIC CAPACITY OF EACH OF THE TEST PAVEMENTS IN THE FOLLOWING MANNER.

THE PAVEMENT WILL BE MARKED TRANSVERSELY AT ONE-FOOT INTERVALS, AND BY THIS MEANS A STUDY WILL BE MADE OF THE LATERAL DISTRIBUTION OF THE TRAFFIC THROUGHOUT THE DAY, SEGREGATING IN THE RECORD THE OBSERVATIONS MADE DURING EVERY 15-MINUTE PERIOD. A TRAFFIC COUNT, SIMILARLY SUBDIVIDED, WILL SHOW THE VARIATION IN TRAFFIC DENSITY THROUGHOUT THE DAY; AND, ONCE IN EACH 15-MINUTE PERIOD, A RUN WILL BE MADE WITH THE TEST CAR EQUIPPED WITH THE TRAFFIC-FLOW RECORDER OVER A DESIGNATED SECTION OF THE HIGHWAY, PAST THE TRAFFIC-COUNTING AND TRANSVERSE-DISTRIBUTION STATIONS.

AS THERE IS INVARIABLY A WIDE RANGE OF TRAFFIC DENSITY DURING THE COURSE OF A DAY, THERE WILL BE OBTAINED IN THIS WAY DATA WHICH WILL SHOW, FOR VARIOUS DENSITIES OF TRAFFIC, THE CORRESPONDING SPEED OF THE TRAFFIC AND THE DISTRIBUTION OF THE TRAFFIC TRANSVERSELY OVER THE PAVEMENT, THE LATTER SERVING AS A MEASURE OF THE DEGREE TO WHICH THE AVAILABLE WIDTH IS UTILIZED.

AS THE ROADS SELECTED ARE THOSE UPON WHICH THERE APPEARS TO BE CONGESTION AT THE PEAK HOURS, IT WILL BE POSSIBLE, BY USING THE TRAFFIC SPEED AS A GUIDE, TO ASCERTAIN THE DENSITY OF TRAFFIC AT WHICH THE CONGESTION FIRST MAKES ITSELF FELT, AND THE VARIOUS DEGREES OF CONGESTION ASSOCIATED WITH GREATER DENSITIES, UTILIZING THE TRANSVERSE-DISTRIBUTION DATA TO DETERMINE WHETHER OR NOT THE AVAILABLE WIDTH OF PAVEMENT IS FULLY USED.



3,118 GRADE CROSSINGS ELIMINATED ON FEDERAL-AID
PROJECTS SINCE 1921

CONTRIBUTED BY THE DIVISION OF DESIGN

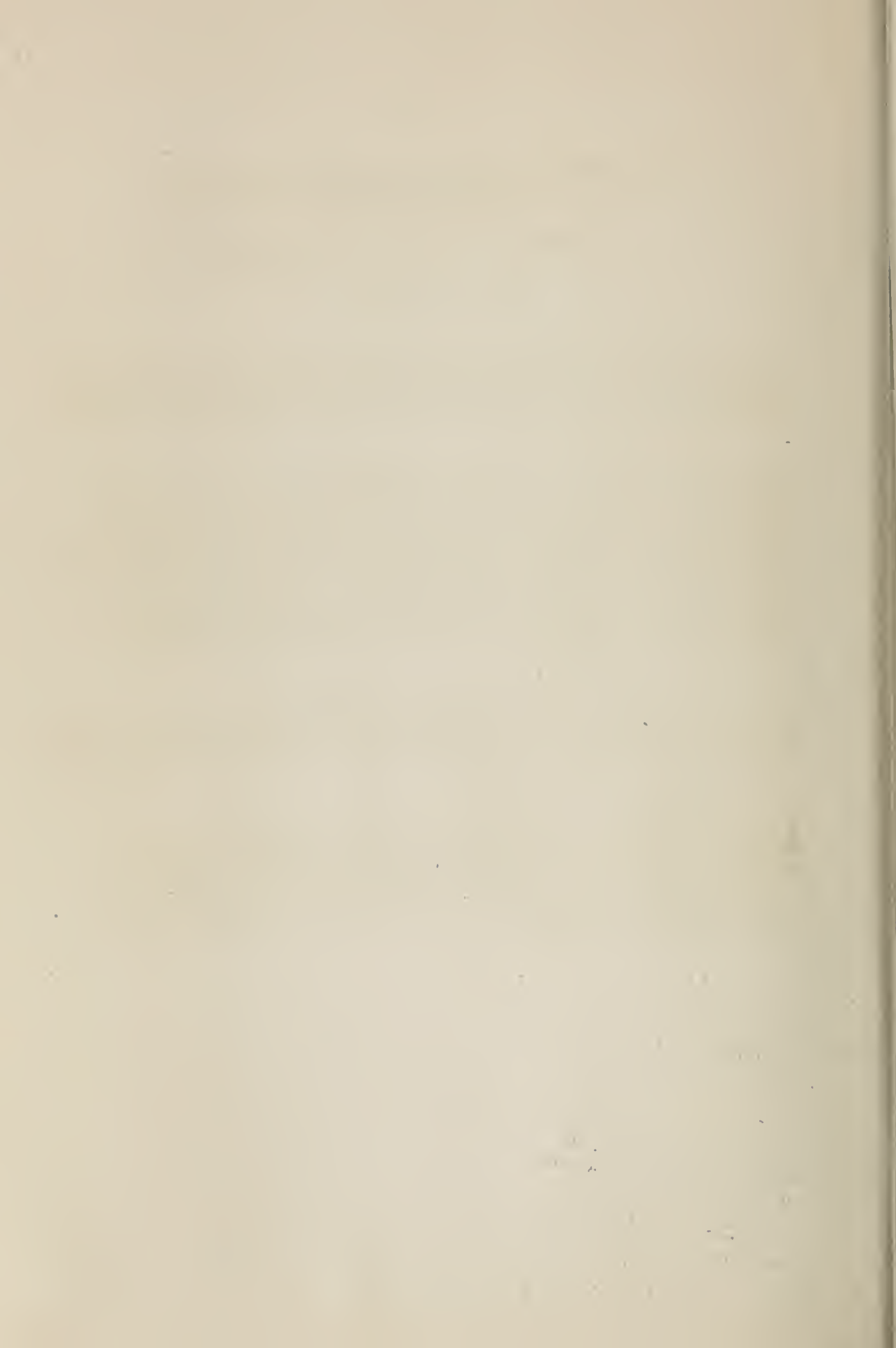
(NOT FOR RELEASE)

SINCE THE PASSAGE OF THE FEDERAL HIGHWAY ACT IN 1921, THE APPROVED PLANS FOR FEDERAL-AID PROJECTS, COMPLETED OR IN PROGRESS ON NOVEMBER 11, 1927, HAVE PROVIDED FOR THE ELIMINATION OF 3,118 RAILROAD GRADE CROSSINGS.

THE PROJECTS, ON WHICH THESE CROSSINGS HAVE BEEN OR WILL SHORTLY BE ELIMINATED, ARE ALL THOSE WHICH HAVE BEEN INITIATED SINCE 1921, AGGREGATING 48,000 MILES. BEFORE THE IMPROVEMENT WHICH HAS BEEN COMPLETED OR PLANNED, THERE WERE 5,635 GRADE CROSSINGS ON THESE HIGHWAYS. THIS NUMBER HAS BEEN REDUCED TO 2,517; AND THE RESULTING IMPROVEMENT IN SAFETY OF TRANSPORTATION IS EVEN GREATER THAN THE MERE REDUCTION IN NUMBERS OF HAZARDS INDICATED, SINCE, ON THE WHOLE, IT IS THE MORE DANGEROUS CROSSINGS THAT HAVE BEEN ELIMINATED.

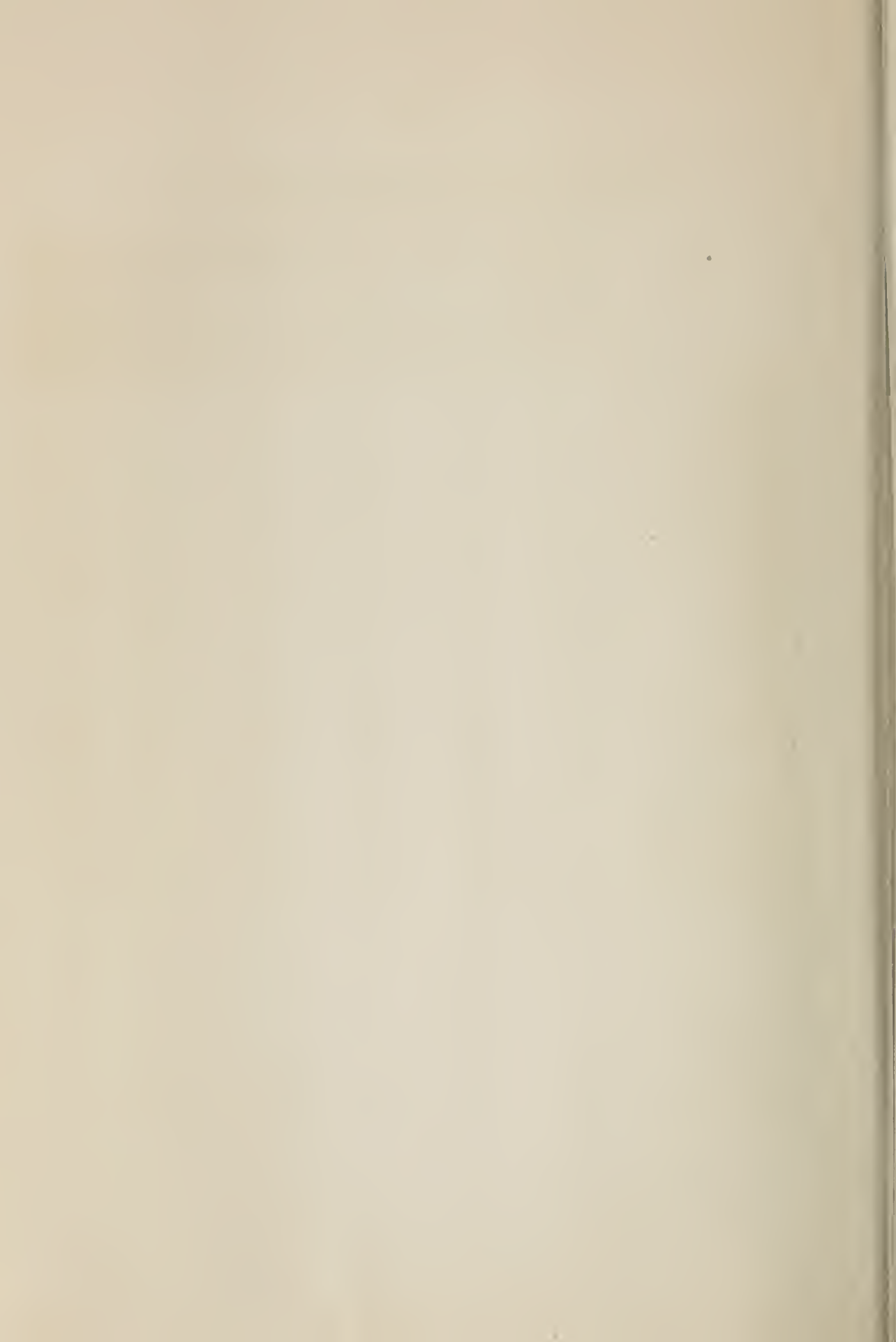
OF THE 3,118 CROSSINGS THUS REMOVED FROM THE PATH OF HIGHWAY USERS, 1,966 HAVE BEEN ELIMINATED BY THE CONSTRUCTION OF GRADE-SEPARATING STRUCTURES, AND THE REMAINING 1,152 HAVE BEEN AVOIDED BY RELOCATION OF THE HIGHWAY.

WHAT HAS BEEN ACCOMPLISHED IN EACH OF THE STATES - THE NUMBER OF CROSSINGS ON THE ROADS BEFORE IMPROVEMENT, AND THE NUMBERS ELIMINATED BY STRUCTURES AND RELOCATION - IS SHOWN IN THE FOLLOWING TABLE. IT WILL BE NOTED THAT, IN EACH CASE, THE DATA ARE TABULATED SEPARATELY FOR PRIMARY AND SECONDARY ROUTES OF THE FEDERAL-AID SYSTEM.



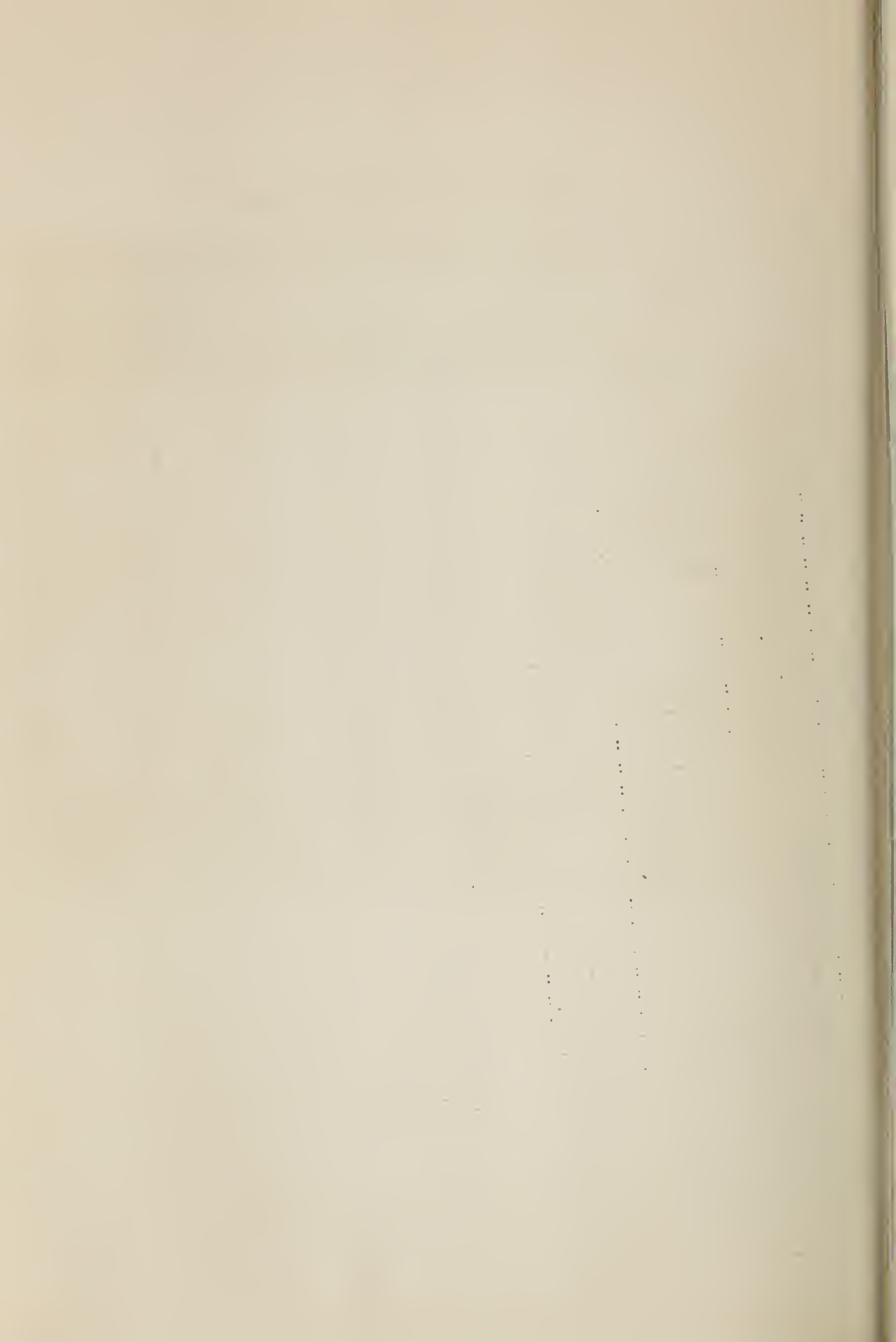
ELIMINATION OF RAILROAD GRADE CROSSINGS WITH FEDERAL AID, FROM
NOVEMBER 9, 1921 TO NOVEMBER 11, 1927

STATE	: NUMBER OF GRADE		: NUMBER OF GRADE		: NUMBER OF GRADE	
	: CROSSINGS BEFORE		: CROSSINGS ELIMI-		: CROSSINGS ELIMI-	
	: FEDERAL-AID IM-		: NATED BY STRUC-		: NATED BY RELOCA-	
	: PROVEMENT		: TURES		: TION OF ROADS	
	PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
	ROADS	ROADS	ROADS	ROADS	ROADS	ROADS
ALABAMA	: 84	: 54	: 40	: 29	: 28	: 20
ARIZONA	: 8	: 26	: 0	: 7	: 0	: 5
ARKANSAS	: 54	: 66	: 5	: 4	: 0	: 2
CALIFORNIA	: 66	: 17	: 38	: 3	: 14	: 2
COLORADO	: 55	: 23	: 24	: 6	: 12	: 6
CONNECTICUT	: 10	: 2	: 4	: 2	: 0	: 0
DELAWARE	: 4	: 12	: 0	: 0	: 0	: 0
FLORIDA	: 18	: 10	: 3	: 4	: 1	: 0
GEORGIA	: 121	: 180	: 37	: 116	: 23	: 99
HAWAII	: 1	: 7	: 0	: 4	: 0	: 4
IDAHO	: 59	: 8	: 30	: 1	: 18	: 1
ILLINOIS	: 103	: 87	: 10	: 12	: 3	: 7
INDIANA	: 68	: 17	: 7	: 3	: 2	: 1
IOWA	: 119	: 91	: 54	: 32	: 30	: 17
KANSAS	: 141	: 89	: 24	: 29	: 13	: 16
KENTUCKY	: 58	: 56	: 17	: 11	: 7	: 7
LOUISIANA	: 45	: 67	: 11	: 9	: 7	: 6
MAINE	: 18	: 38	: 8	: 13	: 6	: 10
MARYLAND	: 8	: 9	: 2	: 5	: 0	: 2
MASSACHUSETTS	: 34	: 17	: 7	: 3	: 2	: 1
MICHIGAN	: 77	: 41	: 19	: 9	: 6	: 5
MINNESOTA	: 188	: 112	: 83	: 40	: 53	: 22
MISSISSIPPI	: 64	: 73	: 32	: 15	: 14	: 8
MISSOURI	: 114	: 59	: 28	: 9	: 14	: 2
MONTANA	: 55	: 43	: 27	: 25	: 19	: 22
NEBRASKA	: 119	: 118	: 31	: 22	: 24	: 16
NEVADA	: 31	: 19	: 23	: 7	: 14	: 6
NEW HAMPSHIRE	: 11	: 29	: 5	: 7	: 0	: 4
NEW JERSEY	: 31	: 22	: 13	: 4	: 8	: 1
NEW MEXICO	: 15	: 31	: 3	: 13	: 0	: 10
NEW YORK	: 58	: 82	: 19	: 19	: 5	: 10
NORTH CAROLINA	: 75	: 62	: 42	: 25	: 12	: 17
NORTH DAKOTA	: 107	: 98	: 30	: 4	: 13	: 3



(CONTINUED FROM PRECEDING PAGE)

STATE	: NUMBER OF GRADE :		: NUMBER OF GRADE :		: NUMBER OF GRADE :	
	: CROSSINGS BEFORE :		: CROSSINGS ELIMI-		: CROSSINGS ELIMI-	
	: FEDERAL-AID IM-		: NATED BY STRUC-		: NATED BY RELOQA-	
	: PROVEMENT :		: TURES :		: TION OF ROADS :	
	: PRIMARY :	: SECONDARY :	: PRIMARY :	: SECONDARY :	: PRIMARY :	: SECONDARY :
	: ROADS :	: ROADS :	: ROADS :	: ROADS :	: ROADS :	: ROADS :
OHIO	: 81 :	: 89 :	: 18 :	: 20 :	: 9 :	: 15 :
OKLAHOMA	: 42 :	: 78 :	: 12 :	: 27 :	: 2 :	: 13 :
OREGON	: 22 :	: 16 :	: 14 :	: 1 :	: 8 :	: 0 :
PENNSYLVANIA	: 103 :	: 96 :	: 36 :	: 37 :	: 19 :	: 24 :
RHODE ISLAND	: 6 :	: 10 :	: 3 :	: 1 :	: 0 :	: 0 :
SOUTH CAROLINA	: 142 :	: 77 :	: 77 :	: 27 :	: 66 :	: 17 :
SOUTH DAKOTA	: 82 :	: 84 :	: 28 :	: 9 :	: 14 :	: 9 :
TENNESSEE	: 45 :	: 25 :	: 15 :	: 10 :	: 1 :	: 5 :
TEXAS	: 180 :	: 263 :	: 82 :	: 139 :	: 14 :	: 106 :
UTAH	: 28 :	: 25 :	: 22 :	: 6 :	: 16 :	: 4 :
VERMONT	: 9 :	: 17 :	: 7 :	: 3 :	: 6 :	: 2 :
VIRGINIA	: 51 :	: 44 :	: 26 :	: 21 :	: 13 :	: 8 :
WASHINGTON	: 49 :	: 21 :	: 23 :	: 5 :	: 9 :	: 4 :
WEST VIRGINIA	: 29 :	: 27 :	: 10 :	: 10 :	: 3 :	: 7 :
WISCONSIN	: 99 :	: 64 :	: 51 :	: 33 :	: 33 :	: 26 :
WYOMING	: 26 :	: 21 :	: 12 :	: 13 :	: 6 :	: 13 :
TOTAL	: 3,013 :	: 2,622 :	: 1,112 :	: 854 :	: 567 :	: 585 :
GRAND TOTAL	: 5,635 :	: 1,966 :	: 1,152 :			



BURLAP CONCRETE-PAVEMENT COVERING SPREAD BY MECHANICALLY-OPERATED ROLL

COMPILED FROM A REPORT SUBMITTED BY C. A. WELTON OF DISTRICT 5.

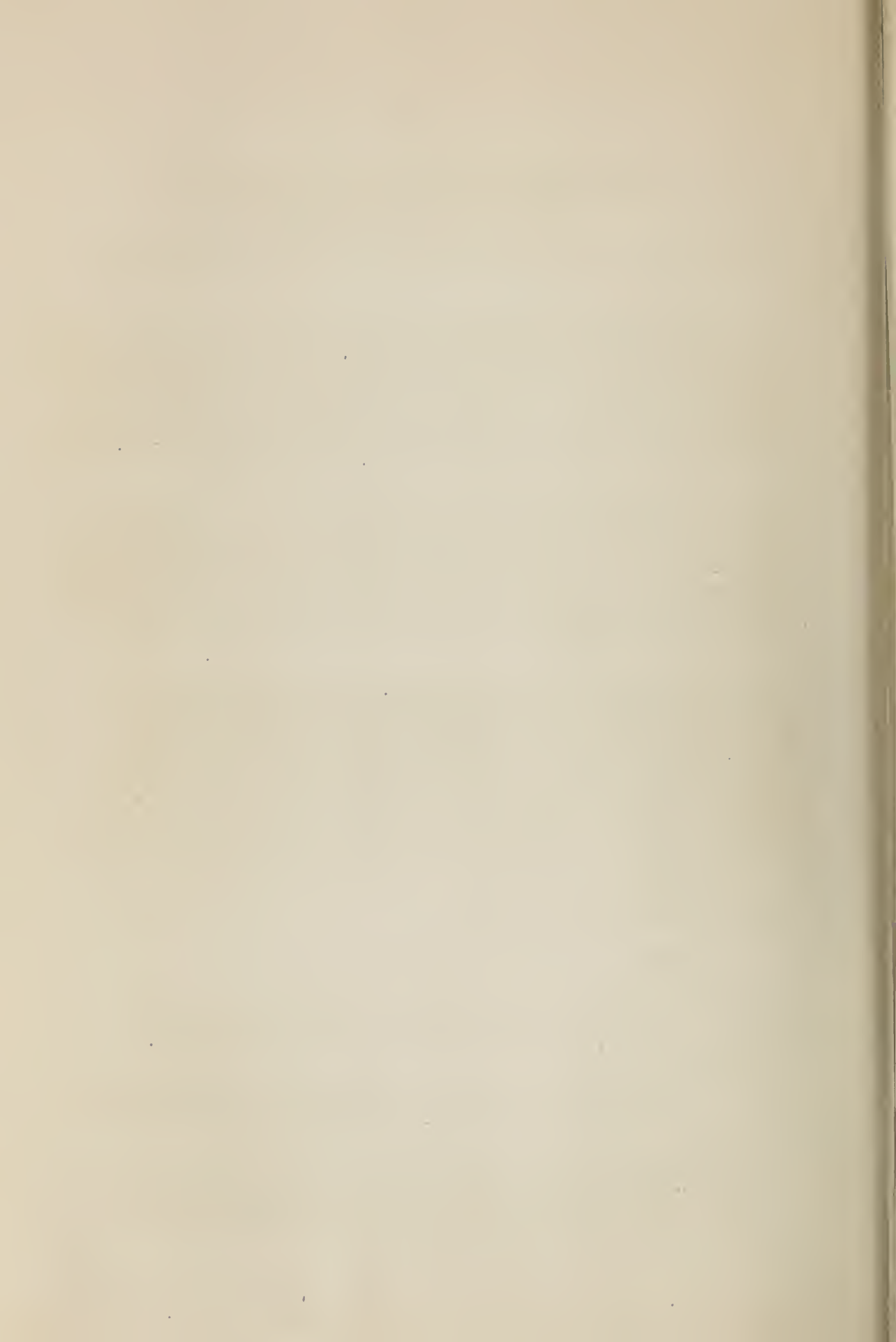
A MECHANICALLY-OPERATED ROLL FOR SPREADING THE BURLAP COVERING, DURING THE CURING PERIOD, WAS USED, IN THE CONSTRUCTION OF THE CEMENT CONCRETE PAVEMENT ON MISSOURI FEDERAL-AID PROJECT 233-C G. THE CONTRIVANCE, WHICH IS SHOWN IN THE ATTACHED ILLUSTRATION, WAS DEVISED BY A MEMBER OF THE CONTRACTING FIRM AND CONSISTS OF A REVOLVING STEEL CYLINDER SUPPORTED UPON A STEEL FRAME THAT IS MOUNTED ON FOUR WHEELS RUNNING UPON THE TOP OF THE SIDE FORMS.

THE HOLLOW STEEL ROLL IS 19 FEET LONG BY 12 INCHES IN DIAMETER. THE FRAME WAS FABRICATED FROM SMALL, ANGLE AND FLAT BAR STEEL. THE ROLL IS ROTATED AND THE FORWARD MOVEMENT OF THE FRAME IS ACCOMPLISHED BY A HAND-OPERATED WINCH CONNECTED THROUGH CHAINS, SPROCKETS, AND GEARS TO THE ROLL AND THE WHEELS. THE ENTIRE CONTRIVANCE WEIGHED ABOUT 400 POUNDS AND COULD BE KNOCKED DOWN FOR CONVENIENT SHIPMENT.

AS THE MACHINE IS MOVED FORWARD THE BURLAP COVERING IS SPREAD AND REWINDING IS ACCOMPLISHED BY THE REVERSE MOVEMENT. THE CYLINDER HOLDS ABOUT 1,200 LINEAL FEET OF COVER MATERIAL. THE BURLAP IS WOUND ON THE CYLINDER AFTER THE ORIGINAL STRIPS HAVE BEEN SEWED TOGETHER INTO A SHEET 18-1/2 FEET WIDE AND OF THE REQUIRED LENGTH. AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY, TWO MEN PUSH THE MACHINE FORWARD AND UNROLL THE BURLAP COVERING SMOOTHLY AND EVENLY UPON THE NEWLY-LAID SURFACE.

THE FOLLOWING ADVANTAGES OF THE MACHINE OVER THE MANUAL PLACING OF THE BURLAP ARE NOTED:

1. - SPEED IN COVERING AND REMOVING BURLAP.
2. - ELIMINATES THE NECESSITY OF OVERLAPPING THE BURLAP STRIPS AND THEREBY REDUCES THE AMOUNT REQUIRED.
3. - SINGLE SHEET OF BURLAP IS LESS EASILY DISTURBED BY THE WIND THAN THE STRIPS. THIS ELIMINATES THE PROBABILITY OF THE TOO RAPID DRYING ON UNCOVERED AREAS.
4. - PROVIDES FOR IMMEDIATE COVERING OF THE SLAB SO AS TO PREVENT TOO RAPID DEHYDRATION OF THE CONCRETE. DIFFICULTY IN THIS RESPECT IS OFTEN ENCOUNTERED WITH THE HAND-PLACED BURLAP STRIPS.





The mechanically-operated roll in position on the steel side forms.
In this case about 500 lineal feet of burlap covering remains on the
cylinder



1790
1791

ORD FINISHER USED FOR SHAPING BITUMINOUS SURFACING

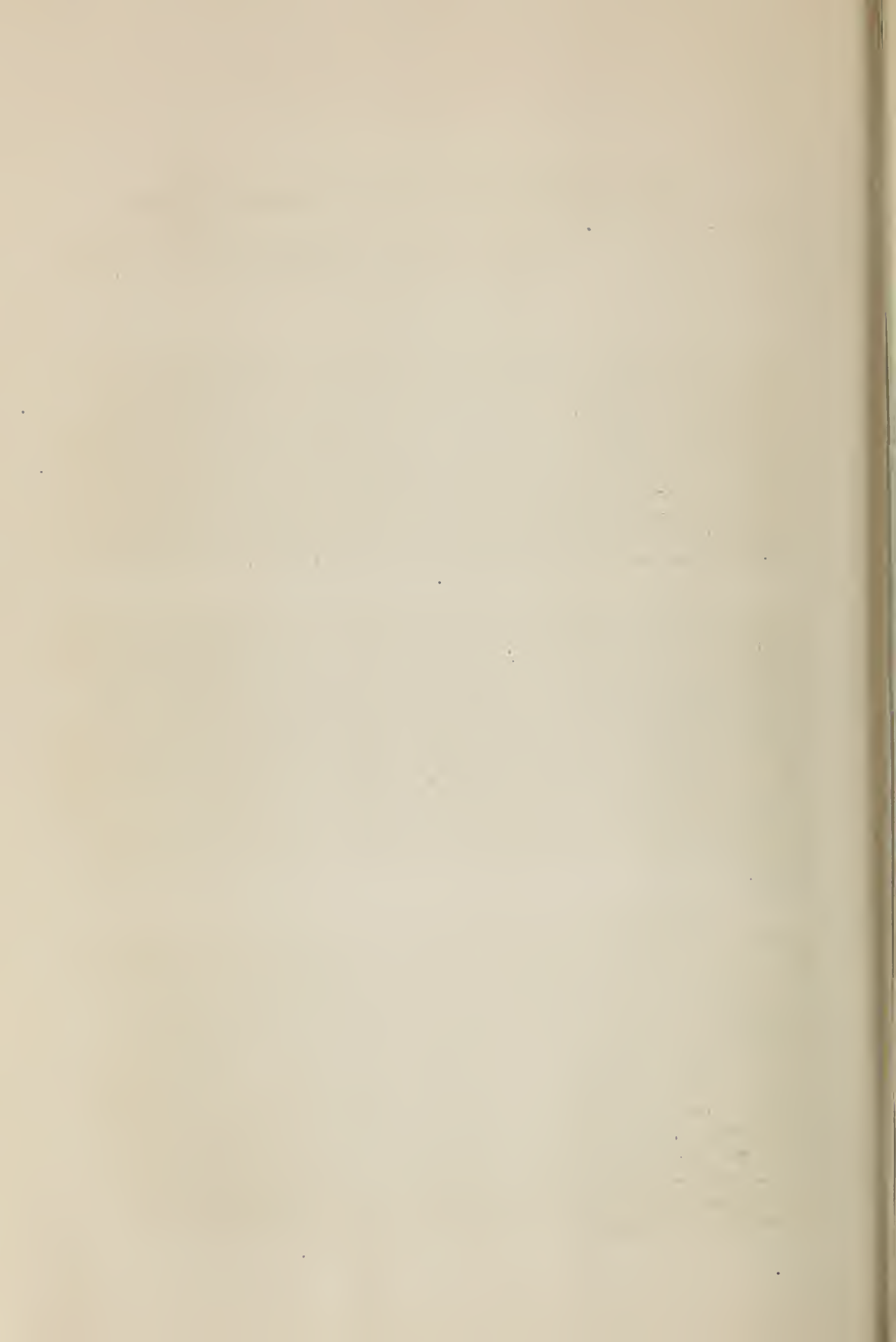
COMPILED FROM REPORTS SUBMITTED BY V. G. WATSON, AND C. F. ROGERS
OF THE DIVISION OF CONTROL

(NOT FOR RELEASE)

THE USE OF AN ORD CONCRETE-PAVEMENT FINISHING MACHINE FOR SHAPING THE SURFACE OF AN ASPHALTIC CONCRETE PAVEMENT, PRIOR TO THE ROLLING OPERATION, IS BELIEVED TO BE A NOVEL DEPARTURE FROM THE COMMONLY ACCEPTED METHODS OF BITUMINOUS PAVEMENT CONSTRUCTION. THE PROCESS, WHICH IS ILLUSTRATED IN THE ACCOMPANYING PHOTOGRAPHS, WAS DEVISED BY SUPERINTENDENT HOLSTROM OF THE GRIFFITH COMPANY, ON THEIR COUNTY-ROAD CONTRACT NEAR PLACENTIA, ORANGE COUNTY, CALIF. AN UNALTERED ORD CONCRETE FINISHING MACHINE WAS USED THROUGHOUT THIS PROJECT WITH SUCH SUCCESS THAT IT ATTRACTED THE ATTENTION OF HIGHWAY ENGINEERS OF THE STATE.

BELIEVING THAT A MODIFICATION OF THE MACHINE WOULD EXPEDITE THE CONSTRUCTION OF THE BITUMINOUS SURFACING ON FEDERAL-AID PROJECT 161-E AT FORMOSA, CALIF.; THE STATE HIGHWAY COMMISSION BOUGHT A NEW MACHINE AND REMODELED IT IN THE SACRAMENTO SHOPS. ALTHOUGH THE RECONSTRUCTED FINISHER IS STILL IN THE EXPERIMENTAL STAGE, IT PRODUCES A SMOOTHER SURFACE THAN IT HAS BEEN POSSIBLE TO OBTAIN BY THE CUSTOMARY HAND-RAKING METHOD. THE VIALOG READING ON THE FIRST HALF-MILE OF MACHINE-FINISHED PAVEMENT - IN SPITE OF THE EXPERIMENTATION AND FREQUENT ADJUSTMENTS OF THE DEVICE - WAS FOUND TO BE 9.5. THIS ESTABLISHES A NEW LOW RECORD FOR THE SMOOTHNESS OF ASPHALTIC CONCRETE PAVEMENT IN THE STATE. THE AVERAGE FOR ALL OTHER ROADS OF THE TYPE BUILT IN 1926 BEING 22.0, AND THE LOWEST PREVIOUS RECORD 15.0.

IN REBUILDING THE MACHINE, THE SIDE FRAME WAS LENGTHENED $1\frac{1}{2}$ FEET, AS SHOWN IN FIGURE 1, AND THE REAR WHEELS WERE MOVED BACK UNTIL THEY SUPPORTED THE ENDS OF THE EXTENDED FRAME. THEN THE REAR SCREED WAS PLACED IN THE POSITION FORMERLY OCCUPIED BY THE BACK WHEELS, AND IN ITS ORIGINAL POSITION THERE WAS SUSPENDED A FRAMEWORK CARRYING RAKING TEETH SET IN TWO ROWS $7\frac{1}{2}$ INCHES APART WITH 3 INCHES BETWEEN ADJACENT TEETH IN EACH ROW. THE TEETH WERE MADE OF $\frac{7}{8}$ -INCH SQUARE STEEL AND EACH WAS TAPERED TO A 45-DEGREE ANGLE ON THE SIDE TOWARD THE REAR. FINALLY, IN ORDER TO CONVERT THE SCREEDS INTO STRIKING TEMPLATES, $1\frac{1}{2}$ -INCH PLATES WERE PLACED UNDER THE TWO ENDS OF EACH WHERE THEY WOULD RIDE THE FORMS, AND IRON PLATES EXTENDING $1\frac{1}{2}$ INCHES BELOW THE BOTTOMS OF THE ORIGINAL SCREEDS WERE BOLTED TO THEIR VERTICAL FACES. THESE VERTICAL PLATES THUS CONSTITUTED THE STRIKING TEMPLATES.



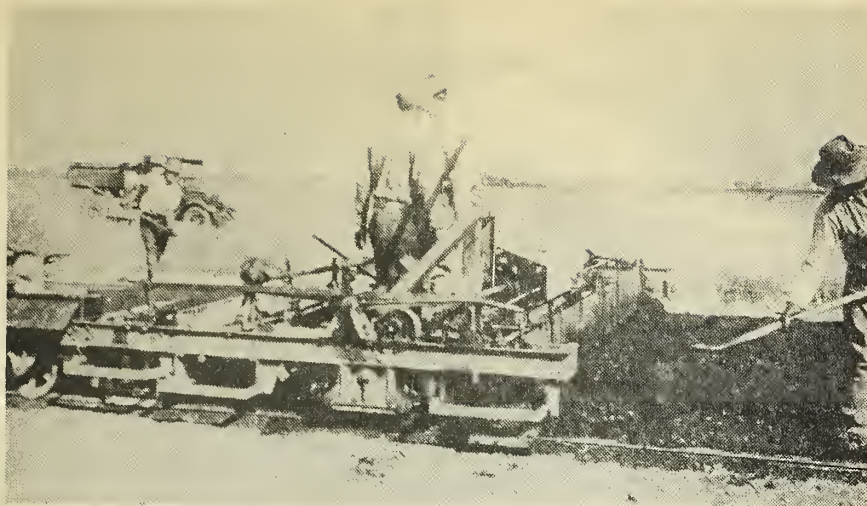


Figure 1. - Close-up view of the remodeled concrete-finishing machine

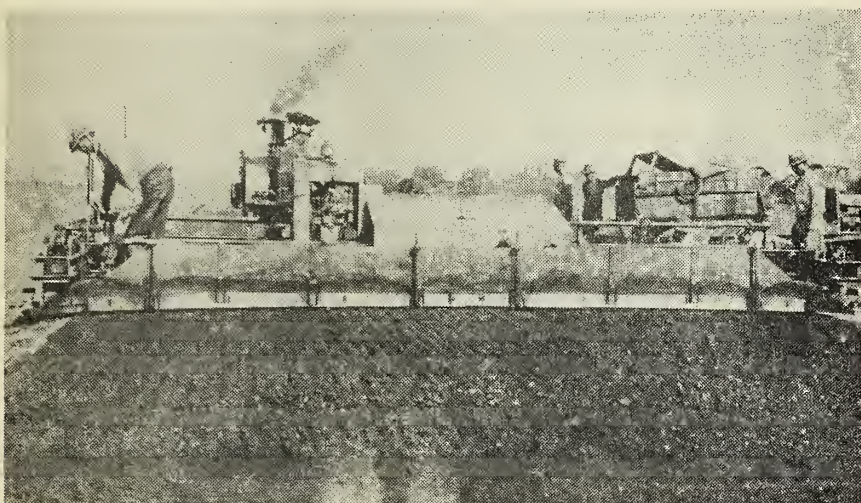


Figure 2. - A view of the front of the machine' showing the extension plate on the front screed

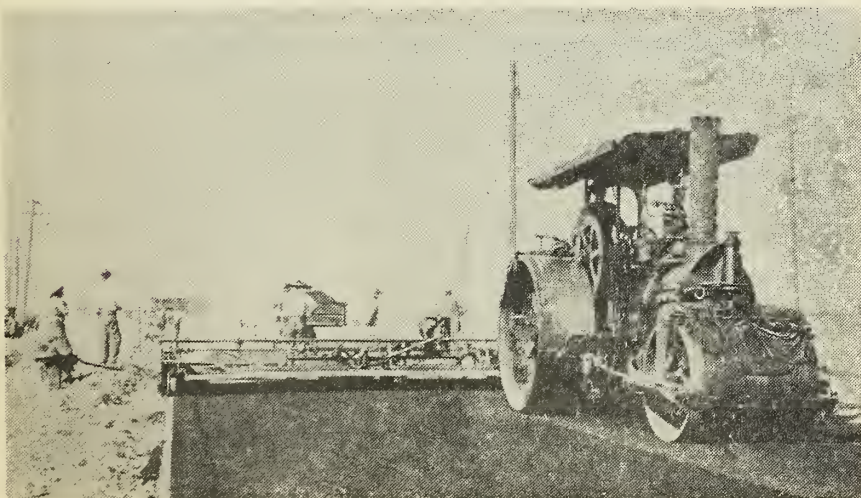
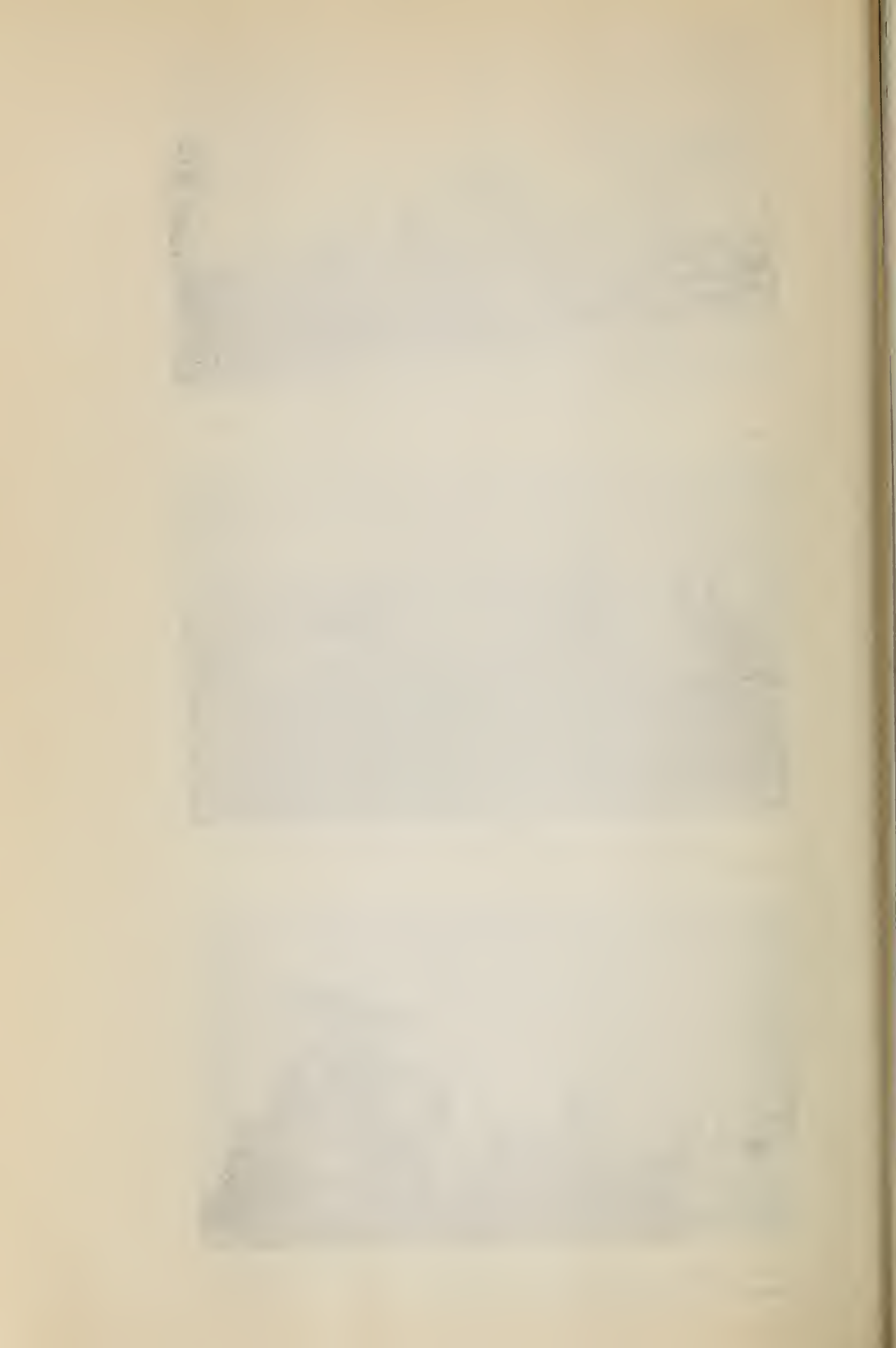


Figure 3. - The leveling course remains high near the side forms because of the sidewise motion of the screed



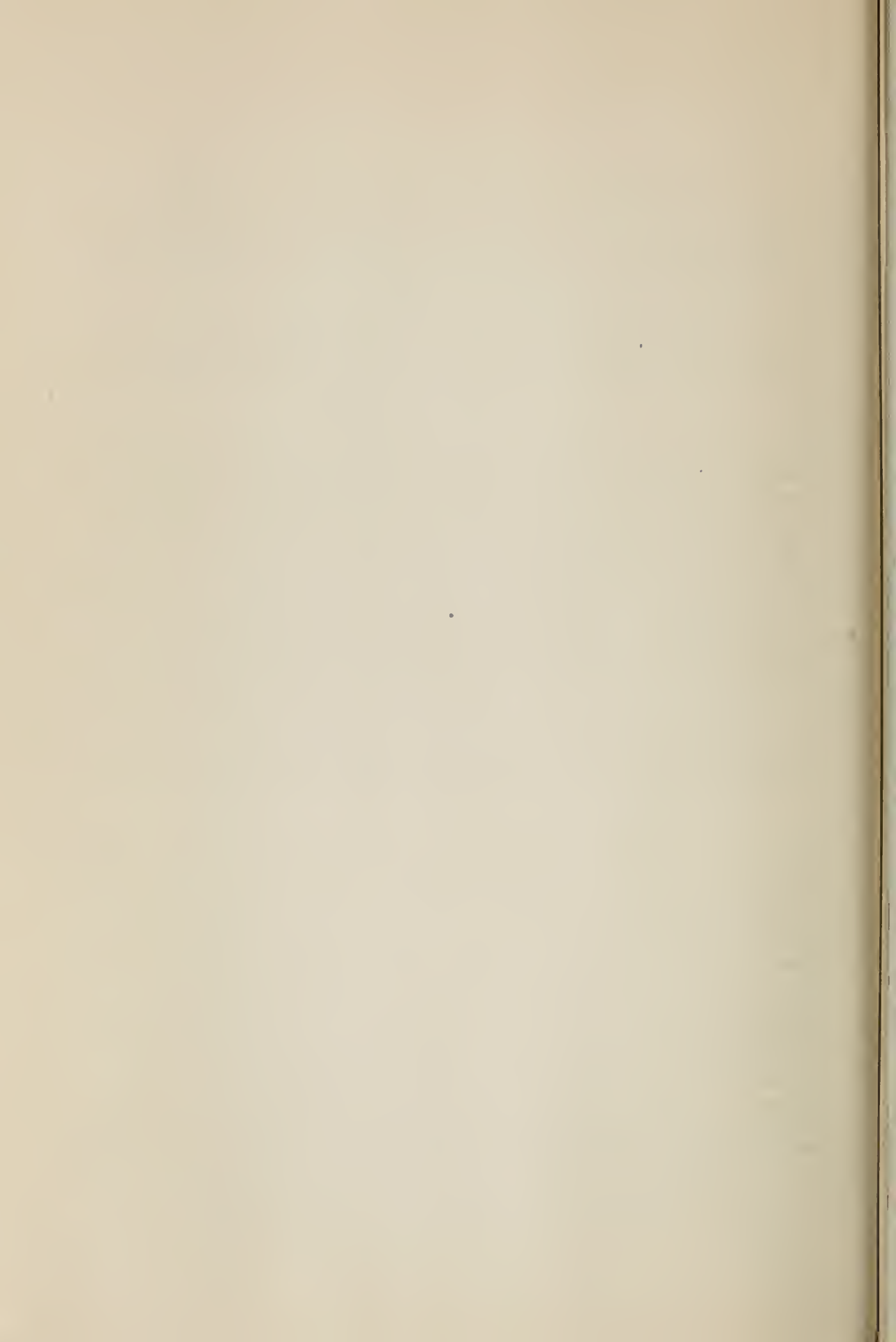
THE FIRST TRIAL WAS MADE ON THE LEVELLING COURSE OF A PAVEMENT, USING THE FRONT AND REAR SCREEDS BOTH SET TO STRIKE OFF THE MATERIAL FLUSH WITH THE TOP OF THE FORMS, WITH THE RAKE BETWEEN THEM, THE PURPOSE OF THE LATTER BEING TO LOOSEN TRAMPLED MATERIAL AND EFFECT A MORE UNIFORM DISTRIBUTION.

IT WAS FOUND AT ONCE THAT THE THREE-INCH SPACING OF THE RAKE TEETH WAS TOO CLOSE. THE RAKE SIMPLY CARRIED ALL THE MATERIAL AHEAD OF IT. ACCORDINGLY EVERY OTHER TOOTH IN BOTH ROWS WAS TAKEN OUT AND THIS DIFFICULTY WAS LARGELY OVERCOME.

THE NEXT DEFECT CAME TO LIGHT WHEN THE LEVELLING COURSE WAS ROLLED AND IT WAS FOUND TO BE IMPOSSIBLE TO COMPRESS THE MATERIAL, WHICH HAD BEEN STRUCK OFF FLUSH WITH THE FORMS, SUFFICIENTLY TO PROVIDE FOR A $1\frac{1}{2}$ -INCH TOP COURSE. THIS DIFFICULTY WAS OVERCOME BY ABANDONING THE RAKE AND REAR SCREED IN THE LEVELLING-COURSE TREATMENT, AND ALTERING THE FRONT SCREED SO AS TO STRIKE-OFF THE MATERIAL THREE-QUARTERS OF AN INCH BELOW THE FORMS. THIS WAS DONE BY ADDING AN EXTENSION PLATE, WHICH WAS MADE ADJUSTABLE IN ORDER THAT THE SCREED COULD ALSO BE USED ON THE SURFACE COURSE. THE ADJUSTMENT WAS EFFECTED BY PROVIDING FOUR THREADED BOLTS WITH WHICH TO RAISE AND LOWER THE EXTENSION PLATE AND FOUR GUIDES WITH WHICH TO KEEP IT RIGIDLY IN POSITION WHEN IN USE. (SEE FIG. 2)

WHEN USED FOR SPREADING THE TOP COURSE IT WAS NECESSARY TO RAISE THE HEIGHT OF THE FORMS BY NAILING TO THEM $1\frac{1}{2}$ -INCH PLATES, IN ORDER TO PROVIDE FOR COMPRESSION UNDER THE ROLLER.

ON THE WORK DONE THUS FAR, BOTH SCREEDS AND THE RAKE HAVE BEEN USED ON THE SURFACE COURSE; BUT IT IS A QUESTION WHETHER THE RAKE SHOULD NOT BE ABANDONED ALTOGETHER. ONE OBJECTION TO IT IS THAT IT LEAVES MARKS WHICH ARE VISIBLE IN THE COMPLETED PAVEMENT; ALTHOUGH A CLOSE EXAMINATION FAILS TO SHOW THAT ANY DEPRESSION REMAINS AFTER ROLLING. AS NEARLY AS CAN BE DETERMINED THESE MARKS ARE THE RESULT OF A SEGREGATION OF THE MATERIAL, THERE BEING A TENDENCY FOR THE COARSER MATERIAL TO FALL INTO THE GROOVES LEFT BY THE TEETH. A FURTHER OBJECTION IS THAT THE RAKE RETARDS THE FORWARD MOTION OF THE MACHINE; AND THIS IS PARTICULARLY SERIOUS IN DEALING WITH THE TOP COURSE BECAUSE OF THE LARGE AREA OVER WHICH A LOAD OF THE HOT MATERIAL MUST BE DISTRIBUTED. AS WITH REASONABLE CARE, IT MAY APPARENTLY BE POSSIBLE TO OBTAIN A SMOOTHNESS OF 12, AS MEASURED WITH THE VIALOG, AND AS THIS IS LOWER THAN THE RECORD OF 15 OBTAINED WITH HAND METHODS, THERE IS SOME QUESTION,



AS STATED ABOVE, WHETHER THE BENEFITS OF THE RAKING FROM THE STAND-POINT OF SMOOTHNESS ARE WORTH WHAT THEY COST IN DELAYED OPERATION.

ONE OTHER DEFECT WHICH HAS NOT YET BEEN ELIMINATED IS ILLUSTRATED IN FIGURE 3. IT WILL BE OBSERVED THAT THE LEVELLING COURSE, WHICH IS SHOWN IN THE PHOTOGRAPH AFTER PASSAGE OF THE MACHINE, IS LEFT HIGH AT THE EDGES. THIS OCCURS ONLY IN THE DISTRIBUTION OF THE LEVELLING COURSE, AND IS CAUSED BY THE FACT THAT THE LENGTH OF THE EXTENSION PLATE ON THE FRONT SCREED MUST BE LESS THAN THE DISTANCE BETWEEN THE FORMS BY AN AMOUNT SUFFICIENT TO PERMIT THE SIDEWISE MOTION OF THE SCREED. THE RESULT IS THAT WHEN THE SCREED MOVES AWAY FROM ONE SIDE OF THE ROAD IT LEAVES BEHIND IT NEXT TO THE FORMS A ROW OF MATERIAL WHICH IS STRUCK DOWN TO THE LEVEL OF THE FORMS BY THE HORIZONTAL $1\frac{1}{2}$ -INCH BEARING PLATE AS IT PASSES OVER. AS YET NO MEANS HAVE BEEN DEVISED TO OVERCOME THIS DEFECT.

JOHN G. ROSE

(NOT FOR RELEASE)

JOHN G. ROSE, ASSISTANT HIGHWAY ENGINEER IN DISTRICT 3, DIED AT 12:30 A.M., FRIDAY, OCTOBER 28, 1927, AT THE ST. LUKE'S HOSPITAL IN DENVER, COLO., FOLLOWING AN OPERATION FOR APPENDICITIS. IT IS POSSIBLE THAT THE ATTACK WAS BROUGHT ON BY TWO AUTOMOBILE ACCIDENTS IN WHICH HE HAD THE MISFORTUNE TO PARTICIPATE, ON SATURDAY AND SUNDAY OCTOBER 23 AND 24, WHILE ON A FEDERAL-AID ROAD INSPECTION TRIP. RETURNING TO DENVER FROM CHEYENNE, WYO., - NEAR WHERE THE LAST ACCIDENT OCCURRED - MR. ROSE WAS TAKEN WITH AN ACUTE ATTACK OF APPENDICITIS AT 2:00 A.M. MONDAY MORNING AND WAS HURRIED TO THE ST. LUKE'S HOSPITAL, WHERE AN OPERATION WAS PERFORMED NINE HOURS LATER. HE NEVER RALLIED FROM THE SEVERE OPERATION AND PASSED AWAY AT 12:30 A.M., FRIDAY MORNING. HE HAD BEEN SUFFERING FOR SOME TIME WITH INTERMITTENT APPENDICITIS AND IT IS PROBABLE THAT THE SHOCK OF THE ACCIDENTS SO AGGRAVATED HIS CONDITION AS TO CAUSE HIS IMMEDIATE DEATH.

JOHN G. ROSE WAS BORN AT HUTCHINSON, KANS., ON APRIL 11, 1878, AND AFTER THE USUAL ELEMENTARY SCHOOLING WAS GRADUATED FROM THE SCIENTIFIC COURSE OF NICKERSON COLLEGE, WITH THE DEGREE OF B.A., IN 1903. IN 1911, HE RECEIVED A B.S. IN C.E. DEGREE FROM THE UNIVERSITY OF COLORADO. AFTER THE CUSTOMARY MISCELLANEOUS ENGINEERING EXPERIENCE - THE MOST IMPORTANT ENGAGEMENTS BEING WITH THE ATCHISON, TOPEKA AND SANTA FE RAILWAY AND THE U.S. RECLAMATION SERVICE - HE ENTERED THE BUREAU, IN APRIL 1919, AS A CHIEF OF ROAD SURVEY PARTY. HIS EARLY ACTIVITIES WITH OUR ORGANIZATION INCLUDED FOREST AND FEDERAL-AID ROAD WORK. BECAUSE OF HIS THOROUGHNESS AND ACCURACY WITH REGARD TO DETAILS, HE WAS PROMOTED, IN JANUARY 1923, TO THE POSITION OF MATERIALS ENGINEER IN DISTRICT 3 AND IN JUNE, 1924, WAS GIVEN THE TITLE OF ASSISTANT HIGHWAY ENGINEER. IN PREPARATION FOR THE MATERIALS ASSIGNMENT, HE WAS DETAILED TO THE HEADQUARTERS OFFICE FOR TWO WEEKS DURING THE EARLY PART OF 1923, IN ORDER TO BECOME FAMILIAR WITH THE PROCEDURE DEVELOPED BY THE DIVISION OF TESTS.

MR. ROSE LEAVES BEHIND HIM A WIDE CIRCLE OF FRIENDS WHO WILL ALWAYS REMEMBER HIS QUIET, GENIAL PERSONALITY. HE WAS GIVEN A MASONIC BURIAL BY HIS DENVER LODGE - UNION NO. 7 - OF THE ORDER OF ANCIENT FREE AND ACCEPTED MASONS. HE IS SURVIVED BY HIS WIFE AND FOUR CHILDREN.

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Public Roads

STATUS OF CURRENT FEDERAL AID ROAD WORK

FOR THE FISCAL YEAR ENDING JUNE 30, 1958

AS OF OCTOBER 31, 1957

D.P.R.-F.A.-1
M-October 1957 - A-1

STATE	BALANCE OF FEDERAL AID FUND AVAILABLE FOR PROJECTS	* UNDER CONSTRUCTION			APPROVED FOR CONSTRUCTION			AMOUNT PAID STATES DURING FISCAL YEAR	COMPLETED AND PAID DURING FISCAL YEAR			AGREEMENTS NOT IN FORCE			P. B. & C. RECOMMENDED FOR APPROVAL BY DISTRICT ENGINEER			STATE
		MILEAGE		Federal Aid	MILEAGE		Federal Aid		MILEAGE		Federal Aid	MILEAGE		Federal Aid	MILEAGE		Federal Aid	
		Original	Stage		Original	Stage			Original	Stage		Original	Stage		Original	Stage		
ALABAMA	\$ 2,224,131.39	469.4	1.9	8	17,795.44	0.3	0.6	1	87,971.54	46,723.58	0.2	\$ 3,291,448.96	408.2	1.6	6	735,210.73	53.2	ALABAMA
ARIZONA	2,928,204.24	1,988,646.44	67.7	4.4	153,741.13	18,915.61	14.1	1,046,586.44	67.7	4.4	17,284.44	0.3	0.6	1	1,098,586.44	0.3	ARIZONA	
ARKANSAS	1,232,581.85	1,880,893.43	223.8	0.4	119,654.41	28,127.59	0.1	1,547,255.09	240.9	0.1	3,058,231.71	130.5	0.4	3	335,312.68	14.8	ARKANSAS	
CALIFORNIA	2,443,715.81	2,443,977.97	294.8	12.4	422,712.34	48,488.54	0.6	1,079,264.32	240.9	0.6	3,009,264.32	244.9	9.2	3	1,009,264.32	25.1	CALIFORNIA	
COLORADO	395,175.53	1,460,489.75	61.2	2.1	144,837.31	352,459.84	17.2	1,401,039.32	58.3	17.2	210,181.78	11.0		2	210,181.78	11.0	COLORADO	
CONNECTICUT	7,015.16	248,371.16	31.1	2.1	127,420.22	74,200.22	14.8	259,434.18	28.7	24.7	3,241,414.53	170.0	77.3	2	580,101.48	4.4	CONNECTICUT	
DELAWARE	790,769.66	2,361,786.98	176.3	37.3	37,115.01	74,200.22	14.8	3,241,414.53	170.0	77.3	250,746.92	18.4		1	682,802.30	75.4	DELAWARE	
FLORIDA	1,874,714.36	7,067,707.66	507.3	44.2	1,462,638.16	1,462,638.16	102.4	6,274,797.37	485.7		2,256,884.64	144.0	2.3	2	2,256,884.64	144.0	FLORIDA	
ILLINOIS	424,558.31	8,184,818.48	518.8	23.6	241,125.05	38,274.92	13.3	551,052.32	457.3	275.6	171,884.22	53.3	0.6	1	195,008.00	89.6	ILLINOIS	
INDIANA	71,264.64	8,475,755.98	801.4	2.8	91,390.93	6.9	2.8	6,371,148.61	507.0		195,008.00	89.6	0.3	1	195,008.00	89.6	INDIANA	
IOWA	682,744.34	8,722,427.43	807.6	17.8	190,180.10	47,825.59	34.8	5,255,403.15	46.0	1.2	417,328.80	31.8	21.8	1	417,328.80	31.8	IOWA	
KANSAS	257,568.40	1,530,768.40	54.3	7.8	361,245.19	74.4	1.3	1,500,464.24	56.6	7.8	391,077.54	78.4		1	391,077.54	78.4	KANSAS	
KENTUCKY	1,005,829.74	682,118.44	49.0		186,499.27	18.9		873,355.64	82.8		197,000.00	21.7		1	197,000.00	21.7	KENTUCKY	
LOUISIANA	1,833,800.68	1,748,724.25	197.7	12.6	170,765.00	13.7	6.5	1,483,125.51	346.3	9.5	335,698.36	22.1	6.5	1	335,698.36	22.1	LOUISIANA	
MAINE	132,471.31	2,119,735.78	190.4	107.6	137,547.53	23.4		1,912,588.36	358.4	17.5	427,660.00	59.3		1	427,660.00	59.3	MAINE	
MARYLAND	432,831.76	3,118,735.78	149.2	27.0	137,547.53	23.4		2,844,344.39	315.2	8.2	642,689.32	49.4	11.9	1	642,689.32	49.4	MARYLAND	
MASSACHUSETTS	498,064.26	3,912,557.34	286.4	37.7	1,047,136.66	195.4	4.2	3,362,149.46	262.8	78.3	642,689.32	49.4	11.2	1	642,689.32	49.4	MASSACHUSETTS	
MICHIGAN	4,053,723.49	2,453,228.79	254.8	6.3	554,841.35	125,272.53	23.3	3,855,152.24	430.6	7.8	165,153.50	23.4	5.2	1	165,153.50	23.4	MICHIGAN	
MINNESOTA	216,515.35	5,168,435.31	1,112.5	31.9	279,219.68	171.5	31.9	1,514,391.98	179.9	31.0	213,217.92	9.5	115.3	1	213,217.92	9.5	MINNESOTA	
MISSISSIPPI	3,131.53	5,662,132.16	100.8		29,110.00	1.9		5,637,427.16	42.0		54,834.01	4.2		1	54,834.01	4.2	MISSISSIPPI	
MISSOURI	1,519,250.43	2,448,139.33	233.7		1,159,347.50	89.2	8.8	1,442,785.56	54.1		101,220.00	6.7		1	101,220.00	6.7	MISSOURI	
MONTANA	3,131,529.95	10,429,015.93	97.1	15.9	1,159,347.50	89.2	8.8	2,482,129.33	233.7		246,292.50	32.8	8.6	1	246,292.50	32.8	MONTANA	
NEBRASKA	126,035.01	2,733,443.81	665.4	33.6	215,645.74	67.1	72.2	1,154,108.32	62.6	28.8	545,407.20	57.3	1.1	1	545,407.20	57.3	NEBRASKA	
NORTH CAROLINA	2,333,078.18	4,644,337.74	335.4	4.8	442,248.00	79.3	11.3	2,415,149.48	856.9	344.8	549,977.87	79.6	84.9	1	549,977.87	79.6	NORTH CAROLINA	
NORTH DAKOTA	182,877.84	1,853,188.24	306.4	11.8	300,291.72	131.1	11.3	1,331,297.74	292.7	4.2	2,365,448.00	121.9		1	2,365,448.00	121.9	NORTH DAKOTA	
OHIO	521,474.31	1,292,425.27	74.1	35.1	65,467.49	38.9	3.2	1,638,724.16	794.4	20.7	1,542,846.00	125.1	4.2	1	1,542,846.00	125.1	OHIO	
OKLAHOMA	435,707.33	333,143.74	21.3	2.0	129,538.67	5.2		1,355,103.74	78.5	35.8	1,029,412.72	57.1	6.2	1	1,029,412.72	57.1	OKLAHOMA	
OREGON	1,147,427.80	2,387,486.78	251.2	93.8	65,399.94	5.2	21.2	2,482,129.33	233.7		105,833.67	7.1	6.2	1	105,833.67	7.1	OREGON	
PENNSYLVANIA	2,533,671.67	2,445,193.10	734.8	113.4	2,025,095.06	99.8	63.6	3,452,158.80	760.8	173.4	361,137.44	54.8	90.5	1	361,137.44	54.8	PENNSYLVANIA	
RHODE ISLAND	4,913,135.74	3,555,985.21	143.8	33.7	216,334.43	75.7	128.5	2,615,147.81	178.4	33.7	205,530.35	12.9	13.8	1	205,530.35	12.9	RHODE ISLAND	
SOUTH CAROLINA	3,197,526.98	6,884,135.65	140.5	198.5	1,153,135.65	115.9		1,832,452.65	132.5	164.4	1,412,672.23	91.1	13.9	1	1,412,672.23	91.1	SOUTH CAROLINA	
TENNESSEE	127,487.93	1,024,194.57	59.3	3.4	391,583.64	37.3	11.1	1,202,693.05	59.7		469,151.28	25.9	14.5	1	469,151.28	25.9	TENNESSEE	
TEXAS	19,489,351.25	16,648.98	119.3	4.0	79,535.23	6.0		2,232,262.67	120.3	4.0	394,000.00	48.3		1	394,000.00	48.3	TEXAS	
UTAH	735,419.73	1,330,566.00	65.5	12.0	469,000.00	58.6	7.1	1,425,502.00	76.6	19.0	350,000.00	20.7	3.3	1	350,000.00	20.7	UTAH	
VIRGINIA	1,251,146.72	2,925,734.05	236.2	11.0	1,616,627.16	108.1		3,225,455.24	266.2	35.7	250,000.00	30.7	3.3	1	250,000.00	30.7	VIRGINIA	
WASHINGTON	1,327,000.00	1,685,000.00	224.1	119.1	1,171,616.10	35.1		1,795,186.55	227.1	119.1	194,717.13	32.1	3.4	1	194,717.13	32.1	WASHINGTON	
WEST VIRGINIA	865,370.35	491,822.64	25.0					491,822.64	25.0					1			WEST VIRGINIA	
WISCONSIN	44,159,351.25	152,542,480.20	14,160.7	2,361.6	16,945,502.19	1,700.6	490.8	30,506,859.31	20,845,865.18	2,014.4	533.3	142,534,520.45	13,722.8	2,146.5	1	142,534,520.45	13,722.8	WISCONSIN
WYOMING																	WYOMING	
TOTALS																	TOTALS	

* INCLUDES AMOUNTS REPORTED COMPLETED (FINAL VOUCHERS NOT YET PAID) TOTALING - FEDERAL AID \$50,334,503.28 - MILEAGE, ORIGINAL 4,763.1 - STAGE 956.2

